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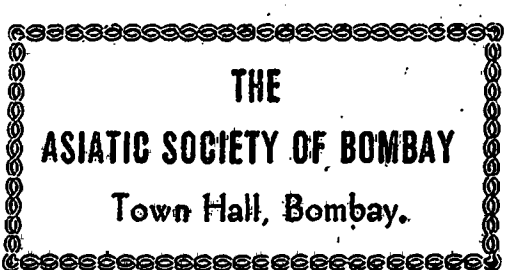

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SELECTIONS

FROM THE

RECORDS OF THE GOVERNMENT OF INDIA,

ME, REVENUE & AGRICULTURAL DEPARTMENT.

NO. CLX.

108415

THE WHEAT PRODUCTION AND TRADE OF INDIA.

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READ—

Volume of Selections from the Records of the Home, Revenue and Agricultural Department, relating to the wheat production and wheat trade of India.

RESOLUTION.

IN December 1876 the Secretary of State addressed the Government of India on several points connected with the Indian wheat trade; and in the January following His Lordship requested, *first*, that a compilation might be prepared showing the main features of the cultivation of wheat in this country, its consumption and export, the selling prices, and the probable cost of transport; and *secondly*, that samples of the chief local varieties of the grain should be transmitted to England for examination. A Resolution was accordingly issued on 14th March 1877, directing the supply of the samples, and calling for the information needed for compliance with the Secretary of State's first request.

2. More than 1,000 samples were collected; but so many were lost, destroyed by weevil or otherwise rendered unfit for valuation, that a test could only be applied to 827. These have been professionally examined in England under the direction of Dr. Forbes Watson, who has submitted a comprehensive report on the results, which are certainly very satisfactory.

3. The volume read above includes Dr. Watson's report and the despatch from the Secretary of State, No. 85, dated 3rd July 1879, with which it was received. No less than 101 samples were classed as superior at prices ranging from 44*s.* to 48*s.* per quarter of 496 lbs. In the 1st and 2nd grades, at prices running from 39*s.* 6*d.* to 43*s.* 6*d.*, there were 358 samples; and 368 were valued at 39*s.* and under. Only 114 of the specimens were decidedly inferior, and the average price for the whole collection was above the average for the United Kingdom at the time. The last English crop was however poor, so this comparison must be somewhat qualified. A certain number of the best Indian samples were estimated at a value equal to that of Australian wheat, whilst

the most numerous classes in the Indian collection corresponded with the better kinds of American wheat.

4. It is thus clear that many parts of India are adapted for the cultivation of wheat of the finest quality. Dr. Forbes Watson observes :—

"We often hear of the ignorance of the Indian ryots and of their careless and shiftless modes of cultivation. But a glance at the collection of Indian wheat under report proves that there must exist all over India a numerous class of agriculturists to whom such a reproach cannot apply. It is impossible to avoid the conclusion that the ryots who grew those samples of soft wheat equal to the finest Australian, or of hard wheat equal to the finest Kubanka, must be as keenly alive to the advantages of selection of seed and of careful cultivation as the most intelligent English farmer."

Although it is said that the samples prove that such ryots are to be found in almost every wheat-growing district, the inference from the reports of the Local Governments certainly is, that in general only ordinary care is used in the cultivation of this staple. The nature, however, of the product seems, in many cases, conclusively to show that the best results of seed and soil have been attained; but this no doubt is due to Native methods, and there is no high farming as understood in Europe.

5. As bearing on the possible future demand for Indian wheat and the statistics of its produce, the following estimate of the wheat outturn of various countries is taken from Dr. Watson's paper :—

Country.	Estimated annual production, in quarters.
The United Kingdom ...	10,000,000 to 13,000,000
Austro-Hungary ...	Each about the same quantity as above.
Italy ...	
Spain ...	
Germany ...	15,000,000 to 18,000,000
France ... each	30,000,000 to 35,000,000
Russia ... each	
United States ...	45,000,000

The average annual import into the United Kingdom is 11 million quarters, and the approximate annual demand for wheat in the market of the world is stated at 20 to 25 million quarters. India, Dr. Watson thinks, should cultivate for export only the finest varieties, in which the competition of Russia and the Far West in America is not likely to be as severe as in the case of the commoner sorts. Moreover, the price of the finer kinds is steadier and can better support the charges of transport and freight. It is noticeable that

the hard white wheat, of which many samples were sent by Bengal, the North-Western Provinces and Bombay, is specially suited for the manufacture of macaroni—an important industry in Genoa, Naples and other places in Italy. Wheat from the Nerbudda Valley is already shipped to Italy for the purpose of this trade.

6. Generalizing from the evidence afforded by the samples, Dr. Watson describes the wheat area of the Indian Empire as the whole of Northern India up to the Gangetic Delta, and, in Southern India, the whole of the tableland above the Ghâts. The reports of the Local Governments show that this generalization is substantially correct. Wheat is cultivated in all districts of Sind, the Punjab, the North-Western Provinces and Oudh. In Bengal, the true wheat-producing country is, as supposed, the valley of the Ganges; though in several other districts there are inferior growings of little breadth, yielding no export. In Assam no wheat is grown for exportation. In British Burma, there is a trifling area averaging during the last five years only a little over 28 acres in the frontier district of Thayetmyo;* the damp climate of the deltaic tracts being unfavourable for this cultivation. The only coast district of Madras that appears in the returns is that of Kistna, and here the area, 2,186 acres, is small: elsewhere in that Presidency wheat is grown to any noticeable extent only in Cuddapah, Bellary, Kurnool, Coimbatore, and the Nilgiris. In Bombay the cultivation is general, except in Tanna, Colába, Ratnágiri and Kánara. There is wheat in nearly every district of Mysore, throughout Berar, and in all parts of the Central Provinces except Sambalpur. Wheat is not grown in Coorg; in Ajmere there are some 16,229 acres. Excluding the coasts of the peninsula and of the north and east of the Bay of Bengal, it may be said that all the territories of British India, except Assam and British Burma, contribute to the total wheat-supply of the country.

7. The statistics obtained from the different Provinces are not everywhere of uniform value. The district returns may, no doubt, be trusted as to the simple fact whether or no wheat is grown; the area under wheat will usually be correctly stated, though in Bengal the means of ascertaining it are admitted to be wanting, and for some Bengal districts no estimate of the acreage sown with wheat has been given.

* Beyond the British frontier the soil and climate in Upper Burma are well suited to wheat cultivation.

The average outturn per acre is necessarily only an estimate, and also necessarily varies with the mode of cultivation, the nature of the soil, and the amount of irrigation available. The average wholesale prices will be correct for the date on which they were reported. In stating the average cost of carriage by road, and in describing the methods of cultivation, the accounts of the district officers will probably, for all practical purposes, suffice, though the remarks just made on the outturn would apply to the quantity of seed sown. The exports and imports of districts should not be relied on implicitly, and even at the best show merely the movements of the local trade, and have no bearing on the total amount of wheat available for export from India. The local names for the varieties of wheat cultivated will have been properly ascertained; but it is only where the different sorts can be identified with the classes appreciated or disapproved by European trade that this information becomes useful. The most disappointing feature, however, in the returns is the impossibility of estimating the total consumption of the country. Wheat, though largely consumed in the Punjab, is rarely the main food staple of the lower classes of the population; and in most cases the attempts to state the average consumption per head of the population are little better than guesses.

8. In reviewing the results apparent from the provincial reports these observations must be borne in mind. As experience of the subject gathers, and as the means of procuring accurate agricultural statistics in the various parts of the country improve, it will be possible to advance general assertions with greater confidence. Subject, however, to the reservation that no more will be attempted than such an approximate outline of the state of wheat production and trade in India as the imperfect information at command admits, the following sketch reproduces the chief points of interest in the reports of the Local Governments.

Madras.

9. The cultivation is very limited, extending over some 22,000 acres out of a total cultivated area of 22 millions of acres.* The yield varies much, from 750lbs. per acre in Cuddapah to 125lbs. in Godavery; the average being 447lbs. There are also great differences in the quantity of seed used,

* The Board of Revenue estimate the area at 23,000 acres; but as the average of five years is 21,656 acres, the round number stated in the text may be accepted.

this being put at 10lbs. in parts of Bellary, and 72lbs. in parts of Cuddapah. The crop is sown in October and November, and reaped in January and February, except in portions of Coimbatore, where the sowings are in May and April and the harvest in September and October. As a rough average, the wholesale price may be taken at Rs. 4-6 per cwt., or Rs. 18-12 per quarter of 480lbs. Wheat is consumed in small quantities by the higher classes as a luxury; but no attempt is made to estimate the total consumption of the Presidency, as the figures furnished by the Collectors are said to be purely conjectural. The export and import by sea to and from places beyond the Presidency in 1876-77 were 493 tons and 5,316 tons, respectively; but in 1877-78 the exports by sea rose to 1,283 tons. Estimating the total produce from the area cultivated in 1875-76 and the average district rates of yield, the result is 9,485,565 lbs. or 19,761 quarters; but this figure must be regarded only as an approximation to the truth. According to the average areas under crop in the different districts the produce would be 22,839 quarters. On the whole, a return of 22,000 quarters may be accepted, which, though above the average rate of yield, is probably about right, because the general rate is lowered by the small outturn per acre of the Kistna and Bellary districts. The report on the quality of the Madras samples was not encouraging.

Mysore.

10. Few of the Mysore specimens were fit for examination, and the highest price assigned (to one specimen only) was 37*s.* 6*d.* The average area under wheat in this Province during the five years ending 1876-77 was 11,135 acres; but in consequence of the famine, this result is too low, and 12,500 acres may be taken as representing the normal breadth of the crop. The average outturn for the same period is 3,234,898lbs. or 6,739 quarters; but, for the like reason, this may be raised to 6,800 quarters. The outturn per acre is stated at 290¼lbs., but the range is remarkable, extending from 54lbs. (more probably 64lbs.) in Kadur to 2,700lbs. in Bangalore. In this district however, as in Kolar, Tumkur and Hassan, the area is very small. The consumption is estimated at 5,649,946lbs. per annum, or greatly in excess of the production. The total exports of wheat to districts outside the Province during five years were only 390,600lbs.,

or an average of 813 quarters per annum. Here, too, the effects of the famine no doubt told; but Mysore may be thrown out of account in any estimate of the wheat export trade from India.

Burma.

11. Burma also need not be taken into view in estimating the total wheat area and total wheat production of the Empire; but though this remark at present applies, it requires some qualification. There is a considerable growth of wheat in Upper Burma beyond the British frontier; and the grain is brought down in large quantities, and supplies the wants of the Province. A small portion of this stock is exported by sea, the latest imperial returns giving the trifling quantity of 1,503 cwts. The Commissioner of the Arakan Division reports that, though no attempt has there been made to grow wheat, there are culturable plains, of wide extent, suitable for its cultivation. This experiment is already being tried on a small scale.

Bengal.

12. Only those districts have been included in the Bengal return in which the cultivation covers a fairly wide area; and as regards most of these the Lieutenant-Governor fears that the statistics entered by the Collectors in the statements are far from reliable. "District officers in Bengal," it is said, "have really no means of giving such correct returns of cultivation, consumption and district trade as are required." The figures of average consumption per head of the population of the district "are particularly meaningless in districts where wheat is not an ordinary staple of consumption; and even where it is, Collectors have no means of forming any reliable estimate." In eleven instances there is no information on this point; and any attempt to ascertain the total consumption of the Province is thus impossible. The area under wheat cannot be stated with the least precision: but omitting districts where the cultivation is unimportant, it is given at 910,974 acres, not including Bhágalpur, the finest wheat-producing district in the Province, for which, unfortunately, no figures are available. Perhaps, however, a total area of 1,100,000 acres may be assumed. The Bengal Government consider that, as the total area cannot be ascertained, any calculation of the total outturn would be

misleading. This may be, to some extent, admitted; but, for the purposes of this review, the roughest approximation is better than none. The average outturn per acre for the whole of the Lower Provinces is estimated by the Government of Bengal at 771lbs., or, leaving out the Sonthal Pergunnahs, where the cultivation is short and the outturn exceptionally high, 720lbs. Accepting the latter figure, the provincial outturn might be represented by 792,000,000lbs., or 1,650,000 quarters; but looking to the rates of yield in different parts of the Province, and to the fact that areas, when not accurately known, are usually understated, this estimate is, no doubt, below the mark. Dr. Forbes Watson puts the figure at four million quarters; but this is clearly much too high. On the whole, the aggregate above given is accepted. It must be remembered that this is an estimate based on an assumed area and a moderate scale of produce to the acre.

The quality of many of the Bengal wheats appears to be excellent. Some of the best sorts come from Beerbhoom (43*s.*), Bhágalpur (39*s.* to 43*s.*), Chumparun (40*s.* 6*d.* to 47*s.*), Gya (41*s.* 6*d.* to 48*s.*), and Patna (37*s.* 6*d.* to 45*s.* 6*d.*)

Central Provinces.

13. The average area cultivated with wheat is 3,515,783 acres, and the average yield per acre is taken by the Local Administration at $10\frac{2}{3}$ bushels, or 640lbs. The aggregate outturn of an ordinary season is thus estimated at 27,946,992 maunds, or 4,657,832 quarters. The estimated local consumption is 14,128,365 maunds, leaving, after deduction for seed, 10,325,253 maunds for export. But the actual exports fall very far short of this figure, and were in 1876-77 only 2,854,910 maunds. At this rate the surplus in the country would amount to about seven and a half million maunds; but, in explanation of this circumstance, the following passage from the Chief Commissioner's report is well worth quoting, more especially because, whilst reserves must, except after famine, exist in all parts of the country, the subject has scarcely been noticed in most of the reports:—

"At first sight this might appear an unnecessarily high surplus, and one that with a run of four or five good seasons would make wheat a drug in the market and bring ruin to the agriculturist, but, carefully examined, there would seem to be little room for these fears, for these seven million maunds, it will be remembered, is only a six months' consumption for the wheat-eating population alone; and if we may suppose

a failure of the wheat-crop in the year after the one which yielded this surplus, it would become necessary to reserve out of this surplus another three and a quarter million maunds for seed, and the actual available surplus in the second year would be only equal to a three-months' consumption of the wheat-eating population. Between these two extremes, of a run of four or five good seasons and maximum produce, and a total failure of the crop in a single year, there would be a graduated series of medium results, *i.e.*, partial failures of the wheat, or failures of the rice and millet crops, making gaps to be filled by the wheat surplus, all which considered, seven million maunds may not perhaps be held to be an improbable surplus in a year of full returns. The popular belief in these matters is, that there is always a reserve in the country sufficient for two years' consumption, taking of course all food-grains into consideration; and if the analogy may be applied to wheat, and to those parts of the country where wheat is the main article of food, it would, according to the above calculations, require the accumulated surplus of four or five good seasons to make up such a reserve."

The Chief Commissioner's general conclusion is, that the Province can afford to export about three million maunds of wheat (or half a million quarters) annually under existing conditions of cultivation, without encroaching much on its food reserve.

It is unnecessary to revise throughout the calculations which have led, in a careful report, to these results. But the Government of India are strongly disposed to believe that for a part of the country where wheat is exceedingly seldom irrigated the average yield per acre has been pitched somewhat high. The figures for the different districts annexed to the report give the low average of 426lbs.; whilst the outturn reported by several settlement officers points to the conclusion that, though this estimate may be below the mark, 640lbs. is above it. Thus in Nimár the yield is stated at from 400lbs. to 500 lbs. on the worst soils to 800 lbs. on the best; in Mandla sowings of forty to fifty seers per acre are believed to return from six to ten fold, the produce thus ranging from 480lbs. to 1,000lbs.; Raipur shows 560lbs.; Biláspur the same; and Hoshangabad 480lbs. On the whole, it seems safer to adopt a figure considerably below that of the Chief Commissioner, and, as in Madras, one quarter per acre may be accepted. On this computation an average harvest would produce about 3,515,800 quarters.

The wheats valued at the highest figures were—"*Pisi*" from Betúl at 46*s.*, "*Sohareea*" from Hoshangabad at 48*s.*, "*white Pisi*" from the same district at the same price, "*Pisi*" from Narsinghpur at 42*s.*, "*Pisi soorkawali*" from

Mandla at 46*s.* 6*d.*, "*Mundi*" from Seoni at 47*s.*, and "*Bansi*" from Bálaghát at 43*s.* The wholesale prices vary from 30lbs. per rupee (Nimár and Hoshangabad) to 160lbs. in Biláspur. But this district and Raipur would not come within the ordinary range of export.

BERAR.

14. The Berar valuations rule rather low, the highest rates assigned being from 41*s.* to 41*s.* 6*d.* for "*Bansi*" wheat, samples of which were received from every district except Wún and Básim. The area under wheat in 1876-77 was 537,830 acres; the average outturn per acre is estimated at 244lbs., and the total outturn at 1,171,700 cwt. or 273,396 quarters. The exports by rail stand at 237,370 maunds or 39,561 quarters, and consumption is believed to amount to 1,562,644 maunds or 260,440 quarters. But here the estimated consumption of Amráoti has been arbitrarily reduced by one-half; and the Commissioner does not regard the figures for any district except Básim as very reliable.

BOMBAY.

15. Although the Bombay returns, consisting of summaries of the local reports, were not received till the 25th July 1879, the Bombay Government has not generalized the results for the whole Presidency. It will be convenient to keep the figures for Sind distinct. The following statement has been compiled from the data available for Bombay Proper:—

Divisions.		Average area under crop in acres.	Average yield per acre. lbs.
Northern	...	611,138	406
Central	...	143,874	246
Southern	...	278,234	243
Total	...	1,033,246	

Applying the average yield to the average area, the products are—

Divisions.			lbs.
Northern	...	...	248,132,028
Central	...	...	35,393,004
Southern	...	...	67,611,105

The total outturn is, therefore, about 731,510 quarters. The average wholesale prices per maund are—Northern Division Rs. 2-10, Central Division Rs. 2-8, Southern Division Rs. 2-5-9; and the average for the Province may be

taken at Rs. 2-8 the maund, or 25*s.* the quarter. For the Southern Division the total consumption is not stated. In the Central Division, excluding Sholápur, it is 546,275 maunds; and in the Northern Division, excluding Broach and Surat, for which no particulars are furnished, it is said to be 2,138,748 maunds.

But it is clear that the Bombay statistics cannot be accepted as worth much. The report for the Northern Division says:—

"Certain figures are available showing the area under wheat; but even these are frequently not reliable. It may, however, be admitted that the figures given to show the area under wheat are fairly accurate, but on the other points the details furnished are manifestly not to be relied on, and are admitted to be so. This remark applies not only to the outturn per acre, but also to the total outturn and to the amounts imported and exported."

With reference to the average and total consumption in the Southern Division, it is observed:—

"It is difficult to give any correct information under these heads, as wheat is not the staple food of the people in the Southern Mahratta Country. It is only the rich and well-to-do classes who can afford to use it for ordinary consumption.

"The poorer classes only eat wheat on holidays. The average consumption per head must, therefore, be very small. It is not possible, in the absence of data, to guess the quantity consumed within the district."

And the returns from the Central Division are, for like reasons, very incomplete.

In quality the wheats from Bombay do not, as a rule, stand high. The best sorts were from Broach (42*s.* 6*d.*), Khandesh (43*s.*), Panch Máháls "*Daudkhani*" (42*s.*), and Belgaum (43*s.*)

Sind.

16. The Sind wheats, however, are generally rather better than the Bombay samples, though the best valuations, those of the kind known as "*shori*" from Hyderabad at 43*s.*, from Shikárpur at 43*s.* 6*d.*, and from the Upper Sind Frontier district at the same price, are not much above the Bombay figures. The returns by districts give the following results:—

Districts.	Average area under crop, in acres.	Average yield per acre, in lbs.
Kurrachee	... 38,959	600
Hyderabad	... 31,124	834
Shikárpur	... 189,733	720
Upper Sind Frontier	... 59,730	392
Thar and Párkar	... 20,762	600

By the same method as was used above, the total yield comes to 462,108 quarters, and the average area, it will be seen, is 340,308 acres. The average price per maund is Rs. 2-4.

Combining the Bombay and Sind totals, we have for the whole Presidency—

		Acres.
Average area under wheat	...	... 1,373,554
		Qrs.
Average outturn	...	... 1,193,618

The remarks below are extracted as having some interest in connection with the peculiar features of wheat cultivation in Sind :—

Kurrachee District.—No case can be cited of an inferior grain being sown, with wheat, as a resource to fall back on, should the latter fail or not fetch a remunerative price. It is not known when wheat has not fetched a remunerative price. As a rule, the cultivator spares neither trouble nor expense with this crop. The ground is carefully broken up, the seed drilled,—the ground, on the whole, kept as clean as the rough implements in use will allow.

It is true manure is not used, and wheat is grown year after year on the same land; but the annual deposit of silt in a great measure neutralizes the mischief of this. It is also true that much wheat is sown broadcast, and some even without ploughing the land at all; but this is done from necessity. If, owing to late subsidence of the inundation, the wheat lands are late in drying, there is no time to prepare them properly—the most is made of them that circumstances will allow.

Upper Sind Frontier District.—Wheat cultivation, although very profitable about the second, third and fourth years, soon begins to impoverish the soil, if it is dependent on floods passing annually over the land. The floods only do good when they carry the Indus silt; beyond that they do more harm than good. The district officers think that it is a very short-sighted policy that fancies, because one or two years after floods splendid wheat-crops can be so easily grown, that it is very profitable to have the floods coming over the land, and being saved all the labour and trouble of distributing Indus water by innumerable canals cut into the heart of the country; but such distribution is, as it were, the life-blood of the country, and enriches the soil.

AJMERE.

17. The Ajmere-Mhairwara wheats appear to be of fairly good quality. Only five samples were valued, but four of these were rated at 40*s.* and upwards, the best being 42*s.* 6*d.* The wheat area has been stated above at 16,229 acres, the average outturn per acre is from 560 lbs. to 600 lbs., and

the total outturn during 1876-77 was 9,476,320lbs. or 19,742 quarters. There is no export of this grain. It is not the ordinary food of the country, and the consumption, calculated on a third of the population, comes to 19,265 quarters, or not much below the produce. The imports, however, amount to 17,481 quarters, which leaves an excessive margin for seed and reserves, and shows that the consumption must have been underrated.

North-Western Provinces and Oudh.

18. An extremely good paper has been furnished, drawn up by Mr. F. N. Wright. His report treats of unmixed wheat, and his remarks on the admixture of wheat with other grains are very instructive.

"Wheat," he says, "is grown either mixed with barley, when the mixture is known as *gojai*, or with gram and peas, when it is known as *gochanna* or *birra*. The precise object of the cultivator in growing mixed crops has long been a matter in dispute, whether, that is, he expects a larger outturn, or a crop more in demand for local consumption, or, as I myself think, he does it to forestall any accident of season. Wheat is a crop highly sensitive to the variations of the weather: parched by the frost, or liable to rust from excessive moisture as wheat is, the hardier barley or gram may help the cultivator through the season when an unmixed crop of wheat might have ruined him altogether. Be that as it may, what is wanted is a pure unmixed wheat, and the cultivation of that alone is to be encouraged; and the prejudice, or whatever the motive is of the cultivator, concerns us only so far as its adoption to a greater or less extent in any given tract affords an indication of the possible supply from that tract of the unmixed grain. Thus we find that, whilst in the richer soils of the northern divisions wheat, unmixed, or in which at least only rape is grown, forms the chief proportion of the crops, in the lighter soils across the Jumna, or I may even say the Sengar, *gojai* (wheat and barley) and *birra* (wheat and pulse) are principally grown, and chiefly on unirrigated lands."

The total wheat area is 6,081,407 acres; for the districts north of the Jumna Mr. Wright estimates the average produce at 750lbs., for those south of that river at 600lbs., and for the Province generally at 700lbs. His report has been prepared with so much attention, that the Government of India hesitate to alter these averages. At the same time it is strange that in the Punjab, where the quality of the soil is on the whole inferior, the yield per acre is put, in a paper framed with equal care, at ten maunds or 800 lbs. It is possible that the more northern latitude of the latter

Province may in some measure explain the discrepancy; but the probability is, that Mr. Wright has underrated the yield in the North-West.

Passing on to further particulars of interest, it appears that strict rotation of crops is not recognised. Sowings begin in the middle of October and last till late in November. The amount of seed sown varies from 58lbs. in Saháranpur to 188lbs. in Sítapur. The crop ripens towards the end of March and is cut up to the middle of April. As regards prices, Mr. Wright's observations no doubt apply *mutatis mutandis* to other parts of the country. He says, writing in June 1878:—

"The average wholesale price of wheat cannot be given with any approach to accuracy. It varies according to the season; and any arbitrary assertion on this point would be unjustifiable and misleading. It may be generally observed that where wheat was selling for 64 lbs. per rupee a few years ago, in 1877 it was fairly steady at about 40 lbs. per rupee, whilst it has risen in 1878 to 28 and 30 lbs. An average rate of 40 lbs. per rupee would pay the cultivator, the collecting agents, and the exporter well. Present rates do not pay the exporter: competition is so keen, and the margin of profit so narrow, that practically present prices are prohibitive."

Wheat is not the food of the masses, who live on the millets of the autumn crop or the coarse mixed grains of the spring harvest. At an outside estimate, he thinks only one-tenth of the population consumes the flour of unmixed wheat as daily food. He estimates the total produce at 1,875,000 tons ($8\frac{3}{4}$ million quarters) and the consumption at 1,066,500 tons; the imports and exports are 14,443 tons and 822,943 tons respectively.

Punjab.

19. Dr. Watson considers that the opening of the Indus Valley Railway will effect a saving in freight and transit charges on Punjab wheat equal to 8*s.* a quarter. He thinks the completion of the line is calculated to bring about a complete revolution in the wheat trade of India, which he regards as likely to assume in the Punjab a magnitude considerably greater than that which it may attain in other parts of the country whence wheat is at present exported. The Punjab samples were much weevilled, and a fresh collection is asked for. It is said of those examined:—

"Examples of the two extremes of Indian agriculture may be found there side by side. On the one hand, the specimen of soft white wheat

sent from Delhi is the best sample in the whole collection, and several other samples are of equal excellence; on the other hand, there are a number of samples, among the red wheats especially, which could only have been grown from seed apparently degenerated through a long course of neglect. As observed in the report, the samples in question, in addition to foreign substances, contain a large proportion of grains of wheat of so stunted a growth and shrivelled appearance as to resemble rather grass-seed than a cultivated grain. The cultivation of such a degenerate wheat is the more astonishing, as, to judge by our samples, seed of first-rate quality seems to be produced in the same or adjoining districts, so that the remedy for the evil is close at hand. One remark may be made on this subject. If the collection presents a fair picture of the varieties cultivated in the Punjab, then it must be inferred that the cultivation of wheat in the Punjab proper, that is, the districts between the Indus and the Sutlej, is conducted with considerably less skill and care than in the neighbouring North-Western Provinces. By far the greater number of the samples sent from the Punjab districts consist of red wheat frequently of a very inferior quality; in fact, the proportion of inferior samples is greater in the Punjab collection than in that from any other province, Madras, Mysore and Burma alone excepted, which can hardly be classed among the wheat-producing provinces. But on account of the incompleteness of the collection, it would be hazardous to draw any definite conclusions."

Whether it is probable that there will be any lasting demand for Indian wheats in the European market is a question on which further remarks will be made below. But supposing such a demand to obtain, there is much in the Punjab report which tends to confirm the view that the Indus Valley Railway will have an important effect on the future of the wheat trade. The export of wheat from the Punjab *viâ* the Indus route has been as follows:—

				Mds.
1874-75	...	...	...	303,911
1875-76	...	...	...	423,853
1876-77	...	...	...	595,153
1877-78	...	...	...	1,305,675

In 1876-77, 258,287 maunds were also exported in the direction of the North-Western Provinces, which may have included some exports to Europe; but, as observed in the Punjab report, the fact that in 1875-76 there were only 36,844 maunds sent that way, whereas in 1874-75 there was an export of 1,000,345 maunds, chiefly on account of the Bengal famine, shows that the Ganges valley and Calcutta do not form the natural outlet for produce exports from the Punjab. The large exports in the summer of 1877, both across the North-Western Provinces frontier and toward Sind, were due to the famine in Bombay; but the export received a

check in the last quarter of 1877, owing to the failure of the autumn harvest in the Punjab and the rise in prices. In 1878 the export toward Kurrachee rose again until it reached 361,528 maunds in the quarter ending 30th September 1878. Of nine lakhs of maunds exported by the Punjab during the six months ending with this date, fully two-thirds went to Sind. This is no doubt due in part to the railway; and the rapid development of the trade in this direction is the more remarkable because prices ruled high during the period of its occurrence. It is probable, however, that much of the wheat thus exported was bought when prices were easier; and it is interesting to note that it is not unusual for grain to be sent to Mooltan from northern districts and kept there for two years or so to wait for a favourable market.

The average area under wheat in the Province during the four years ending with 1873-74 was 5,551,794 acres. The area in 1877-78 was 6,983,904 acres. There has thus been an increase, according to the returns, of more than a million acres during the last three or four years; and from the remarks in the local reports there can be no doubt that some such increase has really taken place. This expansion of the wheat area synchronously with the opening up of the Indus Valley route tends to show that a fairly rapid development of the export trade is not likely dangerously to reduce stocks in hand, or to raise prices to a pitch oppressive to the poorer classes.

The average wholesale price in an ordinary year may be assumed at Rs. 1-9 per maund. An average yield of 10 maunds ($13\frac{1}{3}$ bushels) per acre is, as already mentioned, accepted as fair, so that to ascertain the total produce in maunds it is only necessary to multiply the area by 10. In this way 66,700,000 maunds (about 11,116,700 quarters) may be taken as the maximum probable yield in a fair year unmarked by any noteworthy calamity of season.

As in the North-Western Provinces, the impurity of the crop is in a great measure explained by local circumstances. The natives in some parts prefer a mixed crop of wheat and barley or wheat and gram to a pure crop of any one of these, because, as they are not each dependent on precisely the same conditions of soil and weather, there is always a chance that if one fails the other will succeed.

20. A general estimate can now be framed of the total area under wheat and the total outturn in the whole Empire

in an ordinary year. In round numbers the facts are as below:—

Province.	Wheat area in acres.	Estimated outturn in quarters of 480 lbs., or 6 maunds.
Madras ...	22,000	22,000
Mysore ...	12,500	6,800
Bengal ...	1,100,000	1,650,000
Central Provinces ...	3,515,800	3,515,800
Berar ...	537,800	273,400
Bombay ...	1,033,200	731,500
Sind ...	340,300	462,100
Ajmere ...	16,200	19,700
North-Western Provinces and Oudh ...	6,081,400	8,750,000
Punjab ...	6,670,000	11,116,700
Total ...	19,329,200	26,548,000

In general terms it may be said that there are 19⅓ millions of acres under wheat, yielding an outturn of 26½ million quarters. Dr. Forbes Watson's estimate of 35 million quarters, exclusive of Native States, thus appears to be too high. Compared with the acreage under wheat in Great Britain (3,218,417 acres in 1878), the area is about six times as great; and adopting Dr. Forbes Watson's figures for other countries, India stands fourth in point of production, coming next after the United States, France and Russia. The Provinces where any very considerable quantity of wheat is produced are the Punjab, the North-Western Provinces and Oudh, the Central Provinces, Bengal, and the Bombay Presidency including Sind; and this is the order in which they severally stand in relative amounts of production. Without attaching too much weight to a conclusion which would be partially vitiated if the statistics from the North-Western Provinces and Oudh showed a higher average outturn, it is interesting to note that, in general, the more northern the latitude of the cultivation of staple the larger its yield in grain. In the Central Provinces, the North-Western Provinces and Oudh, and the Punjab the accepted average yields per acre stand at 8 bushels, 11⅔ bushels and 13⅓ bushels, respectively.

21. The latitude, however, has probably but a slight influence on the crop compared with differences in soil and in the mode of cultivation, including in the latter irrigation and the use of manure. In India irrigation has special importance,

though it is difficult to frame any general assertion as to the relative yield of wheat on irrigated and unirrigated lands respectively. The crop always requires moisture; and the better the rainfall and the more favourable the other conditions of unirrigated cultivation, the less will be the divergence in rates of yield. Instances, no doubt, occur where such divergence is enormous; experiments made in the Násik district of the Bombay Presidency in 1874 showed that irrigation more than trebled the yield; but in Surat, according to the present returns, it increases it by 50 per cent. only. In Bombay generally there is very little wheat under canal irrigation, the area in 1877-78 being 4,957 acres out of a total of 24,536 acres; and the yield per acre is usually low. In Sind, where the yield is much higher, a great deal of the cultivation is on the alluvial lands of the Indus moistened by floods or percolation, or both, and often enriched with silt. In Bengal also wheat is much grown in riverside tracts. There is scarcely any wheat in Orissa; but on the Soane canals, where irrigation has lately begun, there will be lands under this crop, though at present no data are available from which the area could be estimated. In the Central Provinces artificial irrigation, as already said, is rare; but in some districts wheat is cultivated on fields embanked so as to retain the rain-water. The Provinces, however, where the irrigation of wheat by canals is really of the first importance are the North-West and the Punjab. A statement* is appended giving the area of wheat thus irrigated compared with the total area of irrigation from canals for the last ten years. The average area for five years in the North-West is 453,842 acres, and in the Punjab, including the inundation canals, 381,556 acres. In the case of the latter Province it may be assumed as a rough approximation to the truth, that the yield per acre of unirrigated lands is between 7 and 8 maunds, of lands irrigated by canals 12 maunds, of lands irrigated from wells 13 maunds, and of lands irrigated by other means, such as hill-streams and natural drainage, 9 maunds; but here the produce of the low-lying river soils, known as *sailab*, and similar in situation and conditions to those of Sind, is classed as unirrigated. Keeping to this classification, it is believed that the statistics of wheat irrigation in the Punjab (the only

* Appendix A.

Province for which such figures are available) stand somewhat as follows in an average year:—

	Acres.
Wheat irrigated from wells	1,600,000
Ditto from canals	381,557
Ditto from other works not under the canal department ...	426,000
Wheat unirrigated	4,262,443
Total ...	6,670,000

The yields above mentioned, if applied to these areas, do not give so high an average as 10 maunds an acre; but that figure has not been altered, because a fairly high rate may safely be taken in a province where the sub-montane tracts have a good rainfall, whilst in the arid country, the Mooltan division and the Derajat, wheat is, and can only be, cultivated on lands irrigated from canals or wells, or on the *sailab*, or on soils flooded by surface-drainage and hill-streams. In the North-Western Provinces and Oudh wheat is irrigated where irrigation is possible; but in the Bundelkhand districts and the low alluvial tracts it is not irrigated, the presence of sufficient natural moisture rendering the construction of wells unnecessary. The crop is taken on the best soils, often near the homestead, and, if so, generally more or less manured. Where, it is said, a canal water-cut passes through a village, there will be found the best cultivation and the best crops; but it is also remarked that the extension of canal irrigation has led to a wider cultivation of wheat without a corresponding increase in the manure supply.

22. But it is in the Punjab that the future of irrigation as bearing on the production of wheat has the greatest practical interest. There are vast areas of waste land in the southern districts of the Province that need to bring them under the plough only population and water; whilst, to judge from the experience of the Bari Doab, the first of these would follow rapidly on the presence of the second. The total area of the Punjab is 104,975 square miles, of which 35,377 only are cultivated, 30,981 culturable, and 38,617 unculturable waste. There are 9,182,313 acres of culturable waste, the property of Government. In the Mooltan and Derajat divisions alone the Government lands recently exceeded seven million acres, the details being—

	Total acres.	Cultivated acres.
Mooltan Division ...	6,722,220	45,171
Derajat Division ...	997,346	3,886
Total ...	7,719,566	49,057

Under these circumstances, it has naturally happened that many canal projects have been entertained; amongst them are the proposed Sirsa, Lower Bari Doab, and Chenab canals, estimated to irrigate a million acres for the spring crop; and the suggested Sidhnai, Chiniot and Ramnagar inundation canals would also give wheat waterings. All these works, except the Sirsa canal, would traverse the Mooltan division; but, from financial and other reasons, nothing has yet been done to give effect to these schemes, which are mentioned merely as illustrating the great possibilities of expansion still possessed by the wheat area. Two canals are now under construction, the Sirhind canal and the Swat canal; the total area to be irrigated by the first is 783,000 acres, and by the second 120,000 acres. On perennial canals in the North-Western Provinces and the Punjab wheat takes up about 40 per cent. of the breadth watered. Applying this proportion, there should be an additional area of wheat on the Sirhind canal of 313,200 acres, and on the Swat canal of 48,000 acres; whilst, if even half the schemes specified in this paragraph ultimately bear fruit, a further addition might be made to the wheat area of at least 200,000 acres, or 561,200 acres altogether. At 12 maunds the acre, the produce for the Province would thus be increased by 1,122,400 quarters.

23. Passing from production to trade, it would be misleading to attempt to state any average wholesale price for wheat throughout India. It may be said generally that wheat is cheaper in the northern than in the southern provinces; but, apart from the vicissitudes of season, one of the most important constituents in price is proximity to or distance from arterial lines of communication. Price in India is specially a matter of time and place; and the question can best be dealt with by fixing upon some particular locality and manipulating the data which it affords.

24. The cost of local transit by cart or bullocks or camels to the railway likewise is not a useful subject for generalization. On the railway, uniformity of rates simplifies the problem; and appended to this Resolution is a table* giving the present cost of haulage of 100 maunds of wheat from some of the principal centres of the wheat trade or wheat districts to Calcutta, Bombay and Kurrachee.

25. Various measures have from time to time been adopted or proposed for improving the Indian wheat supply. At

* Appendix B.

pages of this volume will be found a summary of rules for the inspection of wheat in force in parts of the United States of America; but in regard to these it has recently been pointed out that their object is to facilitate dealings, not to improve quality; and it has been decided that the Government cannot expediently take any steps for their introduction in the existing state of the trade. In the North-Western Provinces* experiments were made in 1876-77 in Jubbulpore wheat, which, however, were not successful. A further trial was undertaken in 1877-78 with the like result; but sowings of Delhi wheat in the same year showed that it had a good prospect of success, especially in Saháranpur and Jhánsi. Much correspondence has passed in recent years† on the desirability of introducing steam threshing machines into India. There are papers of a later date than those included in the present volume; but the Government of India see no reason to depart from the opinion they have more than once expressed, that such machines cannot be profitably used by the ordinary agricultural population in this country. Winnowing machines stand on a different footing. The Financial Commissioner of the Punjab thinks that if such machines were of a kind that could be worked by oxen, it might be of advantage to introduce them. In the North-Western Provinces two winnowing machines have been procured; and their value will be thoroughly tried. The Punjab Government will be asked to communicate with the Government of the North-Western Provinces and Oudh on the subject. Amongst other matters of essential importance to wheat crops, as to crops of other kinds in Northern India, which are receiving separate attention, are the means of furthering the construction of wells, and of improving the machinery for lifting the water.

26. But the answer to the question what should be done to improve the wheat trade, depends upon the nature of that trade itself. In view of the course of Indian trade during the past few years, it cannot be too explicitly stated that, notwithstanding the favourable circumstances of the Punjab, no prediction as to the future of wheat exports can possibly be safe. There may be some trade with Mediterranean ports, but it is the English demand which has hitherto been effectual; and that demand is the result of complex

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* Pages . | † Page .

influences, such as the prices of British wheat and of food-grains in India, the amount of English imports from Russia, Germany and North America, the rate of exchange on India, and the like, a disturbance or alteration in any one of which might produce violent fluctuations. The following figures show the annual imports of British Indian wheat into the United Kingdom, and the average prices of British wheat during the same period—

	Tons.	Average price per quarter.
1875	66,747	45*s.* 2*d.*
1876	163,994	46*s.* 2*d.*
1877	305,247	56*s.* 9*d.*
1878	90,965	46*s.* 5*d.*

The large import of upwards of 300,000 tons thus corresponded with a year when British wheat was at 56*s.* 9*d.*, and the sudden fall of the imports below the figure of 1876 coinciding with the fall of price is also remarkable. The Indian statistics of the same period point to equal uncertainty in the trade. They are—

	Indian exports, in tons.
1874-75	53,453
1875-76	124,909
1876-77	279,166
1877-78	317,007

These figures are for the official year, and show a rapid advance up to 1877-78, coinciding with the expansion in England up to the end of 1877. But in the first ten months of the official year 1878-79 less than 52,000 tons of wheat were exported, and the total export of grains from India during that year, inclusive of wheat but excluding rice, were 82,360 tons only. To this result the fall of prices in England, the influx of large supplies from Russia and America, the exhaustion of stocks in Northern India consequent on previous demands for shipment, and drought ending in partial failure of crops over a very considerable area of Oudh, the North-Western Provinces and the Punjab, causing a rise of price in the Northern Provinces—all contributed. However, the latest information from Calcutta states that the exports of wheat to England are now sixty per cent. in excess of last year, the price in England being high and rising. There is said to be good prospect of a brisk export trade in wheat, if good crops this season release old stocks; but similar combinations of circumstances may at

any time arise to temporarily annihilate the Indian export trade in wheat, which is further specially precarious on account of the variations in exchange.

27. How readily a slight fluctuation in the rate of exchange must trench on the margin of profit appears very clearly from a paper drawn up by Mr. Buck, the Director of Agriculture and Commerce in the North-Western Provinces, in December 1876. He showed that, with the exchange at 1*s.* 7½*d.* and the price of wheat in the Cawnpore bazaar at Rs. 1-9-9 per maund, the quarter of 492 lbs. had to sell in London at 44*s.* 1*d.* in order to pay expenses. About a month before the date in question "No. 1 Club" had stood at 40*s.* 6*d.*; but the calculations being based on an actual transaction, it was presumed either that prices had risen, or that Calcutta dealers had found the advantage of buying thoroughly cleaned wheat. There was other evidence that profits were low, ruling from two to five per cent., and seldom exceeding the latter figure. Now any rise in the exchange has precisely the same effect on exports as a rise in price in India: all other factors being constant, the same quantity of wheat when paid for in English money necessarily represents a smaller number of rupees, that is to say, the exporter obtains in Indian currency a less price for equal shipments; the result therefore is that his profits are diminished just as they would be had he been obliged to pay more for his wheat when he bought it. Assuming the market to be otherwise unaltered, a very slight rise in the exchange might thus convert a two per cent. profit into a loss.

28. This tendency of a rise in the exchange could of course be counteracted by a simultaneous rise in the price of wheat in England, or by reduction in freight, comprising in that term all the expenses between the Indian district of production and London market. In 1876 freights from Calcutta only were at £3 per ton. They have fallen now to 22*s.* 6*d.* *viâ* the Cape, and to £1 10*s.* *viâ* the Suez Canal. Prices at Cawnpore are now Rs. 2-12 per maund; but the reduction in freight makes a difference of about 12 annas the maund, so that the terminal cost in India may be taken at Rs. 2 as against Rs. 1-9-9. The exchange is higher, but notwithstanding the bad harvest in England, the price of No. 2 Calcutta Club was in August 44*s.* for the quarter of 492 lbs. On the whole, Indian wheats are now fetching less than this rate, the ordinary kinds standing at about 39*s.* to 40*s.*

Although the last six harvests in England have been 13 per cent. below the average of the twenty years ending in 1872, the average price of wheat from 1872 to 1878 has been only 49*s.* 7*d.* per quarter. This steadiness is due to the wide area of supply. The total imports from foreign countries during the last five years have been—

	Tons.
1875	2,589,319
1876	2,219,707
1877	2,708,144
1878	2,490,582
1879 (seven months)	1,382,732

Egypt, British North America, Germany, Russia, and, above all, the United States are with British India the main contributors. The quantities imported in 1878 and the first seven months of 1879 were—

	1878. Tons.	1879. Tons.
From Egypt*	10,874	35,095
British North America...	130,179	58,025
Germany	255,906	114,702
Russia	451,646	225,571
United States ...	1,448,195	851,187

Australia has also during the present year shipped nearly as much as Canada. Whilst freights can pay from such distant quarters of the globe, India can only be one, and by no means the most important one, amongst many competitors for the market. The imports from the United States have been steadily rising of late years; and it is known that vast areas of virgin soil are now being broken up for wheat farming both in the States and in the Dominion of Canada.

In the Red River country,† during the seven months ending March 31st, 1878, the United States Government and the railways in Minnesota and Northern Dakota sold about 2,500,000 acres for actual and immediate settlement. Across the Canadian boundary in Manitobah the sales have been, in 1876, 153,535 acres, in 1877, 400,423 acres, whilst in 1878 it is estimated that three million acres of wheat land were allotted in this Province of Canada alone. The immigrants are said to be men of capital and experience, who take up the land as a good investment, and the total area which awaits

* The import of 1877 had been 122,385 tons.

† To complete the present sketch, the information here recited has been taken from an article in *The Nineteenth Century* for July 1879, by Mr. T. T. Vernon Smith.

the settler is believed to be no less than two hundred million acres. Beside these facts the expansive capacity of the Punjab shrinks to insignificance. Moreover, whilst 800 lbs. per acre is the highest average yield that can be assumed for any province of India, the fertility of the new American wheat-fields is as striking as their extent. Reports from 34 different settlements in 1877 gave an average of 32½ bushels or 1,950lbs. per acre; in Canada, along the Assinboine river, in the same year over 400,000 bushels were harvested at an average to the acre of over 30 bushels, or 1,800lbs. It is manifest that India cannot expect to vie with these magnificent resources; and even if the most be made of her productive power, she can only hope for a very moderate share of the wheat trade.

29. With such uncertainties in view, the measures which Government should take are clearly those which, possessing independent commercial or other advantages, will nevertheless materially assist the wheat export trade so far as it can be legitimately fostered. Railway charges should be kept at a minimum; transit from the producing districts to the seaboard should be facilitated; taxes, imperial or municipal, on the grain should, where practicable, be foregone; information should be rendered as accurate as possible and widely diffused; and production should be stimulated by those means which are equally applicable in the case of agricultural products generally. In such directions Government has already taken action. Both the main lines of railway have been repeatedly urged, and with some success, to keep their rates down; the export duty was taken off; octroi duty was prohibited at seaports on grain for export; a railway is to be constructed to Chattisgarh; light railways are being made and have been made in various places; and the attention of Local Governments has been directed to the great advantages that must ensue, as regards all agricultural development, from a more active instruction of the Natives in the cultivation and improvement of thes oil, and the introduction generally of a better system of husbandry. As a result of such measures, the operation of the normal laws of demand and supply will, if the functions of Government are properly discharged, naturally regulate the export trade of the Empire; and this, it is believed, will best subserve the interests of both Europe and India. The policy of the Governor General in Council in the matter, therefore, is

to free the trade from all restriction, and to clear and expedite its course in those directions towards which it spontaneously gravitates.

ORDER.—Ordered, that the Resolution, with the accompanying volume, be forwarded to Local Governments and Administrations.

(True Extract.)

C. L. TUPPER,

Offg. Under Secretary to the Govt. of India.

Appendix A.

Statement showing the area of wheat irrigated compared with the total area of irrigation from canals, in *acres*.

Year.	N. W. Provinces.			Punjab.			
	Total.	Wheat.	Per cent. wheat on total.	Total.	Perennial (P.) or inundation (I).	Wheat.	Per cent. wheat on total.
1868-69 ...	1,441,898	597,936	41·4	1,159,920	P. 786,713	388,845	49·4
					I. 373,207	47,562	12·7
1869-70 ...	1,089,673	383,533	35	1,251,535	P. 730,469	264,699	36·2
					I. 521,066	104,878	20·1
1870-71 ...	1,050,808	461,538	44	1,196,716	P. 734,877	338,447	46
					I. 461,839	92,486	20
1871-72 ...	852,494	366,851	43	1,155,410	P. 731,455	348,787	47·7
					I. 423,955	69,260	16·3
1872-73 ...	940,586	363,530	38	1,143,051	P. 580,616	193,017	33
					I. 562,435	124,451	22
1873-74 ...	1,049,334	402,775	38	973,290	P. 543,893	181,086	33
					I. 429,397	138,031	32
1874-75 ...	1,142,452	446,698	39	1,198,015	P. 662,030	296,660	44·8
					I. 535,985	131,274	24·5
1875-76 ...	1,188,363	471,631	39·6	1,090,015	P. 524,194	171,258	32
					I. 565,821	168,373	30
1876-77 ...	1,239,884	532,315	42·9	1,104,779	P. 569,194	239,558	42
					I. 535,585	129,705	24·2
1877-78 ...	1,461,429	415,793	28·4	1,318,026	P. 774,969	342,649	44
					I. 543,057	109,195	20
Average	1,145,692	444,255	38·7	1,160,143	P. 663,904	276,500	41·6
					I. 496,239	111,521	22·4
1878-79 ...	...	...	...	1,413,219	P. 726,018	312,310	43
					I. 687,201	182,420	26

Appendix B.

Statement showing the rate and cost of carriage of 100 maunds (or 16⅔ quarters) of wheat from some of the principal towns to the sea-ports of Calcutta, Bombay and Kurrachee.

	Distance, in miles.	Cost of carriage.	Total cost of carriage per 100 maunds.	Remarks.
PUNJAB—			Rs. A. P.	
Lahore to Kurrachee.				
Lahore to Mooltan ... (S., P. and D. Railway)	208	¼ pie per maund per mile	107 6 9*	* There is a terminal charge in addition of 3 pies per maund.
Mooltan to Kotri ... (I. V. State Railway) ...	508			
Kotri (Kiamari) to Kurrachee ... (S. Railway) ...	109			
Total ...	825			
Mooltan to Kurrachee.				
Mooltan to Kotri ... (I. V. State Railway) ...	508	¼ pie per maund per mile	80 5 5*	
Kotri (Kiamari) to Kurrachee ... (S. Railway) ...	109			
Total ...	617			
Jullundur to Kurrachee.				
Jullundur to Mooltan (S., P. and D. Railway)	289	¼ pie per maund per mile	117 15 6*	
Mooltan to Kotri ... (I. V. State Railway)	508			
Kotri (Kiamari) to Kurrachee ... (S. Railway) ...	109			
Total ...	906			

Appendix B—continued.

Statement showing the rate and cost of carriage of 100 maunds (or 16⅔ quarters) of wheat from some of the principal towns to the sea-ports of Calcutta, Bombay and Kurrachee— *continued.*

	Distance, in miles.	Cost of carriage.	Total cost of carriage per 100 maunds.	Remarks.
PUNJAB—*continued.*				
Delhi to Kurrachee.			Rs. A. P.	
Delhi to Mooltan ... (S., P. and D. Railway)	556	¼ pie per maund per mile	152 11 9	
Mooltan to Kotri ... (I. V. State Railway) ...	508			
Kotri (Kiamari) to Kurrachee ... (S. Railway) ...	109			
Total ...	1,173			
Delhi to Calcutta ... (E. I. Railway) ...	954	16·6 pies per 100 maunds per mile.	82 0 0*	* In addition, a charge of Re. 1 per 100 maunds is made on account of Hooghly bridge toll. The rates shown apply only to consignments of 250 maunds and above.
NORTH-WESTERN PROVINCES AND OUDH—				
Aligarh to Calcutta ... (E. I. Railway) ...	876	16·6 pies per 100 maunds per mile.	76 0 0*	
Lucknow to Calcutta.				
Lucknow to Cawnpore... (O. and R. Railway) ...	46	⅕th pie per maund per mile.	5 0 0	
Cawnpore to Calcutta ... (E. I. Railway) ...	684	16·6 pies per 100 maunds per mile.	59 0 0*	
Total ...	730	Total ...	64 0 0	

Lucknow to Benares ... (O. and R. Railway)...	202	½th pie per maund per mile	21	0	0*	
Benares to Calcutta ... (E. I. Railway) ...	475	22·0 pies per 100 maunds per mile.	51	0	0†	† An additional crossing cartage charge of Rs. 4-2-8 per 100 maunds is made when booked *viâ* Benares.
Total ...	677	Total ...	72	0	0	
Fyzabad to Calcutta.						
Fyzabad to Benares ... (O. and R. Railway)...	123	½th pie per maund per mile	13	0	0*	
Benares to Calcutta ... (E. I. Railway) ...	475	22·0 pies per 100 maunds per mile.	51	0	0†	
Total ...	598	Total ...	64	0	0	
Allahabad to Calcutta... (E. I. Railway) ...	565	16·6 pies per 100 maunds per mile.	56	0	0*	
BENGAL—						
Patna to Calcutta ... (E. I. Railway) ...	332	22·0 pies per 100 maunds per mile.	‡35	0	0*	‡ During September and up to 15th October 1879 the charge from Patna City and Patna Ghât stations to Howrah will be Rs. 28 per 100 maunds, subject to a minimum charge as for 10 tons per wagon.
Bhagalpur to Calcutta... (E. I. Railway) ...	265	22 pies per 100 maunds per mile.	28	0	0*	
CENTRAL PROVINCES—						
Jubbulpore to Bombay... (G. I. P. Railway) ...	616	annas 10-5 per maund whole distance ...	65	1	8	
Seoni to Bombay ... (G. I. P. Railway) ...	442	annas 8-2 per maund whole distance ...	51	0	8	
BERAR—						
Amraoti to Bombay.						
Amraoti to Badnera ... (A. State Railway) ...	6	annas 9-11 per maund whole distance.	61	15	8	
Badnera to Bombay ... (G. I. P. Railway) ...	412					
Total ...	418					
Akola to Bombay ... (G. I. P. Railway, N. B.)	363	7 pies per ton per mile ...	49	0	3§	§ An additional terminal charge of Rs. 6-4 made per 100 maunds at Rs. 1-11 per ton.
BOMBAY—						
Ahmedabad to Bombay (B., B. and C. I. Railway)	309	7 pies per ton per mile...	41	11	7‖	‖ In addition, a terminal charge of Rs. 3-6-4 is made per 100 maunds at annas 14-8 per ton.
Nasik to Bombay... (G. I. P. Railway, N. E. D.)	116	7 pies per ton per mile...	15	10	7§	
Poona to Bombay... (G. I. P. Railway, S. E. D.)	119	7 pies per ton per mile...	16	1	1§	

WHEAT PRODUCTION AND WHEAT TRADE OF INDIA.

No. 130, dated India Office, London, the 21st December 1876.

From—Her Majesty's Secretary of State for India,

To—The Government of India.

I transmit, for the information of Your Excellency, an extract of a letter from a merchant in London, on the subject of the qualities of Indian wheat which are most appreciated in the English market, and of the means by which the price given for them might be raised. Besides the points therein mentioned, it is desirable that attention should be drawn to the loss resulting from the mixture of barley or gram with the wheat, and from the want of cleanliness in the granaries in which it is stored, and in the boats in which it is carried to the port of shipment. Any means by which the importance of remedying these defects can be impressed on the people may have a very salutary effect on the trade.

2. I have applied for further information on the subject of a system of inspection said to be adopted in the United States and Canada, as described in the accompanying extract from a statement relating to the trade of Canada.

Extract of a letter from a London Merchant, dated December 1876.

With reference to the interview I had with you last month as to the growth and production of wheat in the Empire of India, I now beg to lay before you a short statement of the present position of the trade, to which I have paid close attention the last three or four years.

Calcutta.—The wheats that come from this port are fine, mellow, soft, white, from Cawnpore, Meerut and Delhi districts, which bring the highest price in the market (except the finest Bombay, which, however, so far, has not formed an article of import owing to inadequate prices obtained in London and Liverpool), and are very clean on the whole. They could, however, be improved by proper blowing and exhaust machines and sifting machines; and I should recommend this to be done so as to get rid of grain, tares and barley as much as possible. If this cleaning process is enforced by the district officials, I have no doubt these fine wheats could be made worth 2*s.* to 4*s.* per quarter more money in the United Kingdom. As far as I can make out from merchants who have been in the north-west, the name these fine wheats go by is "Pegu" or "Pegoo." In our market it goes by the name of No. 1 Club.

I next come to a wheat, inferior to the above, which I understand goes generally by the name of "Doodiah" or "Doodeah," being called in our market "No. 2 Club." This is the quality we see most of, and it is very well liked, as, in preparing for use, it absorbs a great weight of water, which, of course, is very profitable for the miller in this country. The great drawback to it, however, is its foulness caused by admixture with grain, tares and barley. There is no reason, however, why in two

or three seasons this fault should not be almost entirely remedied by your officers attending to properly-cleaned seed being put into the ground.

I next come to a white-grey hard wheat, which appears to me to come from low ground, as it is almost as hard and flinty as rice. On the whole, it is a clear wheat; still it could be improved by the seed-wheat being better attended to.

I next come to a soft red wheat, which appears to me to come from the same districts as the "No. 2 Club," as, except in colour, it seems to be the same style of grain. It is quite as foul as the "No. 2 Club," and, by properly cleaning it for seed, I have no doubt its value as an article of trade could be raised also 2*s*. to 4*s*. per quarter.

Another class of wheat we see largely from Calcutta is a rather large-berried wheat, classed between the No. 1 and No. 2, which we call in Mark Lane "Mountain Club"; parties who have seen it grow telling me it comes from pretty high ground. This is a clean wheat, but can also be improved by the seed being more carefully attended to.

The last wheat I would name as coming from Calcutta is from the Central Provinces, and is called "Jubbulpore." The district where it is produced lies about half-way between Bombay and Calcutta by rail, and most of it goes to the west coast for shipment; and I therefore treat this under the head of—

Bombay.—The wheats from this port seem to be all produced in Central India. At least all I have seen, whether soft or hard, shows a long bold grain, just like the Jubbulpore.

No. 1, White Bombay, is the finest wheat I have ever seen from India, and it does not seem possible to improve upon it when I state that it sells at close to the same price as Australian (the finest wheat imported).

No. 2, Bombay White, is also a superior article, but its great drawback is the coarse large-grained brown wheat, and some pains ought to be taken to have this grain extracted. The same cleaning machines named elsewhere in this paper might be tried to get it out; but I doubt the success of this process, and suspect the only way to bring the No. 2 wheat up to the No. 1 is to hand-pick out the coarse brown grain and sow the wheats separate. In three or four seasons, by this mode, I feel sure, the quantity of No. 1 Bombay White might be much increased, and No. 2 decreased in proportion.

The next wheat to be noticed as exported from Bombay is the long-berried coarse brown wheat, a good article, but not much known on this side, and does not bring within 5*s*. per quarter of No. 2 White.

From Bombay also is exported a very fine long-berried hard wheat, of which large quantities have gone the last two seasons to Marseilles and other Mediterranean ports; but it is not liked here, being too much of rice nature. So far as the Bombay wheat trade is concerned, the production of the fine wheats should be as much encouraged as possible for the United Kingdom consumption, and as regards cleaning, where necessary, the machines mentioned elsewhere are the best.

Madras.—So far as I know, no wheat has reached the United Kingdom from that Presidency; but I have this season seen a sample of red wheat thence which would do well for use in our markets, being of a sound, strong, red type.

Kurrachee.—The export of wheat from the Indus country through this port has been at times considerable, and there seems to me no reason why it should not rapidly increase. The quality of the wheat, white and red, is soft and mellow; but its great drawback is the large admixture of barley it contains, which ought to be got out. I have no hesitation in saying that, in four or five years, Kurrachee shipped wheat would be improved 3*s.* to 5*s.* per quarter if due attention were paid to the cleaning of the seed wheat. The machines I allude to elsewhere are the very thing for the purpose; and I have great confidence in the future of the Indus country as growing wheat, since the grain itself is mellow, and easy for the miller to handle.

Machines.—I have taken a good deal of trouble in this matter, consulting Dell & Son, of Mark Lane, who are clever, intelligent machine inventors and makers, and most respectable people. I send you several copies of their last list, and Mr. Dell, junior, has kindly noted a few remarks against the machine* he specially points to for seed-wheat cleaning purposes. He is supplying D. Sassoon & Co. with machines for cleaning the wheat shipped now so freely at Bussorah on the Persian Gulf; and, from experiments on foul wheats from India, Persia and Syria that I have seen, there is no doubt Messrs. Dell & Son understand their business in recommending the machines they do.

* Prospectus annexed.

Of course, I need hardly tell you that the cause of the sudden increase in the wheat trade with India is the opening up of the Suez Canal, thus enabling wheat to arrive in London and Liverpool in 42 to 48 days from Calcutta from dates of bill-of-lading, in 35 to 38 days from Bombay, in 40 to 45 days from Kurrachee, by which means the ravages of the weevil are much checked; and altogether the trade is rapidly settling down to a regular one, the quality of wheat from India generally competing well with Russian, British and American sorts. It appears to me that the grand thing to point to is to get the wheat as cheaply as possible to the ports, either by cheapening railway carriage or improving the rivers, or increasing and extending canals—probably, you will say, by doing all.

Before ending these remarks, which I fear you may find wearisome, I should not like you to suppose that shipments are made by the Suez Canal alone, though they are so entirely from Kurrachee, and very much so from Bombay. From Calcutta, however, large quantities of wheat are shipped yearly by sailing vessels, and it is found the grain stands the voyage well by being stowed at the bottoms of the ships in bags, where no light or air can get to it, thus keeping the destructive weevil quiet and in a dormant state.

If you want any more information, I shall be glad to give it you, or obtain it for you if it is not within my personal knowledge.

As far as I can find out, the Calcutta people call the different wheats as follows:—

Soft red, "Jamajallee."
Hard ditto, "Gungajallee."
Soft white, "Doodeah."
Soft white (fine, North-West), "Pegu" or "Pegoo."

Extract from "Report on the Home and Foreign Trade of Canada for 1875."

FACILITIES FOR TRANSFERRING GRAIN, ETC.

* * * * *

With all the facilities referred to at his command, the grain merchant in Montreal stands in a most important relation to the markets of Europe on the one hand, and the vast cornfields of the western world on the other. In response to orders by cable, he either forthwith buys Canada wheat on the spot or near at hand, or he directs the purchase of grain in Chicago or Milwaukee. Subjected as it is, at these great centres, to the most perfect system of inspection in existence, it arrives at Kingston, and is there transferred to barges of similar capacity to the vessels from which it is delivered; and, passing through the cool waters of the river St. Lawrence, the cargo of wheat, corn, rye, or other grain, is placed alongside the ocean-going ship for transport across the Atlantic. All this is accomplished, as must be evident, without the possibility of the grain being changed, or mixed with an inferior quality, by the way (a result which cannot be relied upon by any other route), thus giving additional value to the inspection certificate which was issued for the cargo at the original port of shipment. Not the least important consideration is, that the northerly latitude of the Canadian transportation route relieves the grain from all danger as to *condition*, even in the summer months, when the risk by other channels is comparatively great.

(MESSRS. DELL & SON'S PROSPECTUS.)

Royal Gold Medal Prize Blowing, Winnowing, and Screening Machines.

The universal approval and many prizes accorded to this machine have given rise to many imitations. Every part of these machines is made to a standard gauge, thus ensuring an accuracy of fit and facility of repair unequalled in any other machine of this class. The care and attention which has been bestowed upon the production of these improved machines, together with the sound principles upon which they are constructed—ensuring durability and efficiency to a high degree—have already brought them into extensive use. They are made of the very best materials, are light, simple, pleasing in appearance, such as can olny be obtained by first-class design and workmanship.

For separating and cleaning all kinds of grain and seeds for market, this machine has no equal. For export they are not to be surpassed, being durable and simple. They are capable of cleaning grain as fast as one man can fill the machine, being a complete blowing and dressing machine at one time, but can be used as a blower separately, if required. Having an eccentric motion, it can be thrown in and out of gear, making two complete implements in one. Large stock always on hand.

PRICES:

No. 1.*—Machine, complete with blowing apparatus, riddles 22 by 18 inches, £10.

No. 2.—Same as No. 1, without blowing apparatus, £9.

No. 3.—Small size without blowing apparatus, riddles 18 by 18 inches, £8.

Blowing apparatus to No. 3, 15*s.* extra.

Seed riddles, 10*s.* extra.

No. 4.—New size for small occupations, riddles 16 by 16 inches, £6 10*s.*

For shipment, machines can be made in sections, so that six machines will occupy the measurement of one when erected.

No. 14, dated India Office, London, the 18th January 1877.

From—Her Majesty's Secretary of State for India,
To—The Government of India.

In my despatch of the 21st ultimo, No. 130, I drew Your Excellency's attention to the importance of measures adapted to encourage the improved cultivation of wheat, and to facilitate its transport to this country in good condition.

2. It seems very desirable that a compilation should be prepared, as has already been done with various Indian products, showing the main features of its cultivation, consumption, and export, the local selling prices for a series of years, and the probable cost of transport from the chief markets to the place of export. An attempt to prepare such a paper has been made in the department of the Reporter on Products; but it was found that the information in this country was not sufficient for the purpose.

3. A selection should also be made of the chief local varieties of the grain, and samples should be sent to England carefully named and described, so that their place of production could be certainly distinguished, in order that the opinion of competent persons in this country may be obtained as to their market value. This latter suggestion is one which might, in my opinion, be advantageously acted upon with the least practicable delay.

Extract from the Proceedings of the Government of India in the Department of Revenue, Agriculture and Commerce (Agriculture and Horticulture),—No. 1—39-50, *dated Calcutta, the* 14*th March* 1877.

Read the following despatches from the Secretary of State :—

No. 130 (Statistics and Commerce), dated the 21st December 1876, forwarding an extract from a letter from a merchant in London, on the subject of the qualities of Indian wheat which are most appreciated in the English market and of the means by which the prices given for them might be raised, and drawing attention to the importance of the adoption of measures with a view to encourage the improved cultivation of this

* This machine, with special sieves, will do 8 to 10 quarters per hour of the sample tried. If put through twice, a great improvement would be made on the first sample.

grain and to facilitate its transport to England in good condition.

No. 14 (Statistics and Commerce), dated the 18th January 1877, requesting that a compilation be prepared, showing the main features of the cultivation of wheat, its consumption and export, the selling prices, the probable cost of transport; and that samples of the chief local varieties of the grain, carefully named and described, may be made and sent to England.

Read also the following papers showing the action taken by the Chief Commissioner of the Central Provinces, with a view to improving the quality of the wheat in those Provinces and preventing its admixture with other grains:—

Circular No. 11, dated the 5th May 1876.

Extract paragraph 3 from a circular No. 25, dated the 4th August 1876.

Circular letter No. 3433-162, dated the 9th September 1876, and enclosures.

RESOLUTION.

OBSERVATIONS.—The development of the export trade in Indian wheat has long occupied the attention of the Government of India. In January 1873, on the representation of the Bombay Chamber of Commerce, who urged that the weight of the export duty and the length of the sea voyage practically disabled Indian wheat from successfully competing with any country in the English market, except perhaps California and Australia, the Government of India freed Indian wheat from all duty on export.

2. Since then, aided by various other circumstances, particularly the shortened transit through the Suez Canal, and recently the state of exchange, and perhaps to some extent the political condition of Eastern Europe, the increase in the trade has been very great, as will be seen from the figures appended showing the quantity and value of the wheat exported to foreign countries:—

	Cwt.	Rs.
1871-72	637,099	23,56,445
1872-73	394,010	16,76,900
1873-74	1,755,954	82,76,064
1874-75	1,069,076	49,04,352
1875-76	2,498,285	90,10,255
1876-77 (first ten months)	4,839,290	1,67,34,001

Seeing that the quality of Indian wheat has commended itself to English millers, it may be hoped that, with the advantages she now possesses, India will be able to maintain this important trade at a high level. But it must not be forgotten that this country has active and eager competitors in the United States, Southern Russia, Austro-Hungary, and Egypt, and that some of these countries are naturally possessed of great advantages in the shipment of wheat to England. It is necessary, therefore, that the greatest care should be taken by every body interested in the trade, from the cultivator to the shipper, to

prevent any cause for complaint regarding the quality of the grain exported.

3. It appears from the despatch No. 130, received from Her Majesty's Secretary of State, that complaints are now made of the dirty condition of Indian wheat received in England, as well as of its admixture with inferior grains. The Governor General in Council desires that these papers may be circulated amongst district officers and published for general information. To some extent the complaints regarding the dirty condition of our wheat will diminish with the extended employment of the railways in its carriage to the port of shipment, in supersession of boats, and with the increased facilities of despatch from the port. A great deal may also be done by the trade in undertaking the cleansing and sorting of the grain before it is shipped. It would appear from a letter from the firm of Messrs. Scott, Finlay & Co. of Bombay to the Chief Commissioner of the Central Provinces that, in the present state of the market, it would hardly be profitable to incur much expense in such cleansing and sorting. But probably, with an increased demand for cleaned and sorted wheat, it will prove remunerative to set up winnowing and sorting machines of the kind referred to in the communication from Her Majesty's Secretary of State at the great centres of shipment, *viz.*, Bombay, Kurrachee, and Calcutta. In view of the poverty and ignorance of the agricultural community of India, the Governor General in Council does not consider that it would be expedient to suggest the employment in the rural districts of machines, the purchase of which would require capital which is probably not forthcoming, and the repair of which, when broken, could not be effected except at the Presidency towns. His Excellency in Council considers, however, that much may be done in the way of advice and instruction by district officers to impress upon the agriculturist the necessity of so treating his crop, after it has been reaped, as to keep it reasonably clean, and that such advice will be welcomed and acted upon by the cultivator in his own interest as soon as it is made clear to him that clean wheat will command a readier and better market than dirty grain.

4. The question of admixture of wheat with inferior grains, such as barley and gram, is a separate matter. It is not probable that the adulteration is altogether fraudulent. The truth is, that the cultivating classes, who do not largely consume wheat themselves but the inferior grains, have hitherto been in the habit of sowing these inferior grains with their wheat in the same field, the object being to have some resource to fall back upon in the event either of failure in the wheat crop or of difficulty in selling it at a remunerative price. As long as circumstances operated against the development of a steady and sure trade in wheat, this practice of the cultivator could perhaps only be regarded as dictated by prudence. But circumstances have changed, and a practice which formerly was reasonable has now no reason for continuance, and indeed its continuance will have an injurious effect on the cultivator. There seems little reason to doubt that the agricultural community will be ready to modify this habit on becoming acquainted with the facts of the case, and that they may easily be persuaded either

to cease to cultivate inferior grains in the same field with wheat, or to be careful in reaping to keep them apart. The local officers in each district should cause them to be properly instructed in this matter, and they should specially impress upon the cultivators the need for careful selection of their seed. Much good may result from judicious action in this direction; and the Governor General in Council commends the matter to the particular attention of the local authorities. His Excellency in Council has noticed with much satisfaction the steps which have already been taken toward the attainment of the object desired by the Chief Commissioner of the Central Provinces.

5. The Secretary of State for India desires that a paper may be prepared, bringing together all the facts procurable regarding wheat cultivation in India. To assist in the preparation of such a paper, the Governor General in Council requests that in each province a memorandum may be drawn up showing, as far as the information may be available,—

(1) the names of the districts in which wheat is grown;
(2) the area (in acres) under wheat in each of the last five years to the end of 1876-77;
(3) the average outturn in pounds per acre;
(4) a brief account of the cultivation, in which should be stated the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars;
(5) the average wholesale price of wheat;
(6) average consumption per head of the population of the district;
(7) total consumption within the district;
(8) annual imports into the district for five years, and places whence imported;
(9) annual exports for the same period, places whither exported, and proportion carried by road, rail, or river;
(10) estimated average cost of cartage to the railway station nearest the district;
(11) cost of transit to port of shipment (Calcutta, Bombay, or Kurrachee), by rail, by road, and by river;
(12) local names for the varieties of wheat cultivated, and their description in English; and
(13) a general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.

6. It is also requested that no time may be lost in obtaining the samples of wheat required by the Secretary of State. It is desirable that these should be put up in bags containing two pounds each, properly labelled with the name of the district in which the wheat was grown and its distinctive name. These samples should be forwarded to this office as soon as possible, without waiting for the completion of the information asked for.

ORDER.—Ordered, that a copy of this Resolution, with a copy of the papers read in the preamble, be forwarded to the Local Governments

and Administrations, with a request that the necessary measures may be taken without delay to carry into effect the suggestions and instructions contained in this Resolution. The Governor General in Council will be glad to receive any suggestions which Local Governments and Administrations may desire to make with a view to the further development and improvement of the trade.

No. 17, dated Calcutta, the 30th March 1877.

From—The Government of India,

To—Her Majesty's Secretary of State for India.

With reference to Your Lordship's despatches Nos. 130 and 14 (Statistics and Commerce), dated the 21st December 1876 and 18th January 1877, we have the honour to forward copy of a Resolution, together with the papers read in the second part of its preamble, from which Your Lordship will learn what preliminary steps we have taken with the view of carrying out Your Lordship's instructions in regard to the adoption of measures for improving the quality of Indian wheat.

No. 1—39-50, dated the 14th instant.

2. We will furnish Your Lordship in due course with the samples of wheat required and with copies of our further proceedings in the matter.

No. 1324, dated Ootacamund, the 17th August 1878.

From—C. G. MASTER, Esq., Secy. to the Govt. of Madras,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to the latter part of paragraph 2 of my letter dated 12th June 1878, No. 897, I am directed to forward the accompanying Proceedings of the Board of Revenue dated 1st May 1877, No. 2015,* and 11th June 1878, No. 1551,† the latter giving cover to a statement embodying information on the several points indicated in paragraph 5 of the Proceedings of the Government of India of 14th March 1877, No. 1—39, respecting the cultivation of wheat in the Madras Presidency.

* Proceedings of Government, 11th June 1877, No. 1943.

† Proceedings of Government, 17th August 1878, No. 1323.

2. In the Proceedings above quoted, the Government of India asked for suggestions from Local Governments "with a view to the further development and improvement of the trade" in wheat. No remarks on these points seem called for from this Government, as the Board's communication of 11th June 1878, now sent, shows that the cultivation of,

and export trade in, wheat in this Presidency are very limited. The Madras Chamber of Commerce also say that it is out of their power to contribute to the desired information. Their letter on the subject, dated 16th May 1877,* is enclosed.

* In G. O., 11th June 1877, No. 3271.

Extract from the Proceedings of the Government of Madras in the Revenue Department,—No. 1943, *dated* 11*th June* 1877.

Read the following paper :—

Proceedings of the Board of Revenue, Madras, No. 2015, dated 1st May 1877.

Read the following Proceedings of the Madras Government, dated 4th April 1877, No. 1318, Revenue Department :—

ABSTRACT.—*Indian Wheat:* Calling upon the Board and Chamber of Commerce to offer suggestions in view to the further development of the—required by the Government of India.

The Board observe that the cultivation of wheat in this Presidency is very limited, and is chiefly confined to six districts as shown below :—

District.	Fasli 1281.	Fasli 1282.	Fasli 1283.	Fasli 1284.	Fasli 1285.
Kistna ...	2,632	2,016	2,180	2,219	2,145
Cuddapah ...	2,206	1,783	3,078	4,160	2,283
Bellary ...	4,922	3,564	6,269	3,338	3,387
Kurnool ...	7,072	6,323	8,083	7,835	5,557
Coimbatore ...	2,709	2,312	2,526	2,235	2,108
Nilgiris ...	3,004	3,412	3,098	3,227	3,199
All other districts ...	681	387	1,383	291	667
Total acres ...	23,226	19,797	26,617	23,305	19,346

Year.	WHEAT.	
	Quantity.	Value.
	Cwt.	Rs.
1871-72 ...	3,856	18,753
1872-73 ...	4,987	23,392
1873-74 ...	17,329	89,723
1874-75 ...	9,643	47,076
1875-76 ...	8,764	36,292

The total area under this grain during the last five faslis has averaged only 22,500 acres. The marginal statement shows the quantity and value of wheat exported to Foreign Ports and British Ports beyond the Presidency during the last five official years. These papers will, however, be communicated for information to all Collectors and to the Superintendent of Government Farms.

2. The Collectors of the districts named above will publish suitable extracts from these papers in the district gazette, and will, as far as is practicable, impress on cultivators the importance of sowing wheat crops separately and of sending the produce clean to market.

3. The Collectors just named will also forward at once to the Board specimens of the different varieties of local wheat named in the vernacular and described in accordance with the requisition contained in the Government of India Resolution. The Board will, if necessary, have them classified by the Superintendent of Government Farms.

4. These specimens should be sent to the Board in duplicate. The Board will then take measures for ascertaining the value in the English market of such varieties as are approved and likely to meet with a demand there with a view to encouraging their production in the districts.

5. The Collectors of the districts named above are requested to send, at their early convenience, a brief report on the subjects specified in paragraph 5 of the Government of India Resolution. The report should be in twelve paragraphs, following the order of subjects there mentioned.

ORDER THEREON BY GOVERNMENT OF MADRAS.

Recorded.

Extract from the Proceedings of the Government of Madras in the Revenue Department,—No. 1323, *dated 17th August* 1878.

Read again the undermentioned papers :—

Proceedings of the Board of Revenue, dated 1st May, No. 2015, and recorded in G.O., 11th June 1877, No. 1943.

Letter from the Chairman, Chamber of Commerce, Madras, dated 16th May, and recorded in G.O., 11th June 1877, No. 3271.

Read also the following :—

Proceedings of the Board of Revenue, Madras, No. 1551, dated 11th June 1878.

Read the following reports on wheat cultivation received from Collectors with reference to Board's Proceedings, dated 1st May 1877, No. 2015 :—

From the	Collector	of Godavery,	dated	3rd	December	1877,	No. ——
„	„	of Kistna	„	17th	November	1877	„ 2623.
„	„	of Cuddapah	„	15th	September	1877	„ 577.
„	„	of Bellary	„	4th	May	1878	„ 145.
„	„	of Kurnool	„	26th	December	1877	„ 1109.
„	„	of Coimbatore	„	25th	March	1878	„ 35.
„	Commr.	of Nilgiris	„	11th	July	1877	„ 67.

RESOLVED, that a general statement prepared from the above be forwarded to Government with reference to G.O., dated 4th April 1877, No. 1318.

2. Wheat cultivation is very limited in this Presidency, the area devoted to this crop being about 23,000 acres out of a total cultivated area of upwards of 22 millions of acres. The cultivation is chiefly carried on in Kurnool, Bellary, Nilgiris, Coimbatore, Cuddapah, and Kistna. The area under wheat within British territory throughout the whole Presidency in each of the last five years is shown in the margin.

	Area as per crop statement.
Fasli 1282 ...	... 19,797
„ 1283 ...	... 26,617
„ 1284 ...	... 23,315
„ 1285 ...	... 19,346
„ 1286 ...	... 12,365

3. The outturn of crop per acre reported by Collectors varies very considerably for the different districts. It is highest in Cuddapah (750 lbs.), 600lbs. in Nilgiris, from 600 to 135lbs. in Kurnool, 516lbs. in Coimbatore, and 193lbs. in Bellary.

4. Black cotton, dark loam, and alluvial soils are generally considered suitable for wheat. The mode of cultivation of this crop does not differ materially from that of other grains. It is chiefly grown on dry lands, although irrigation is occasionally resorted to. Land is ploughed and manured in the usual way, and the seed is either drilled in or sown broadcast. After the plants have sprouted and grown to some height, the ground is harrowed once, and the crop is weeded twice or thrice. The quantity of seed sown per acre is variously given in the different districts. In Cuddapah it varies from 12lbs. to 72lbs., in Bellary from 10 to 20lbs., in Kurnool from 22 to 48 lbs., in Coimbatore from 14½ to 40lbs. and in the Nilgiris it is given as 42 lbs. Wheat is generally raised under the north-east monsoon. It is sown in the months of October and November and reaped in January and February, excepting in parts of Coimbatore, where it is sown as early as April and May and reaped in September or October. The wheat grown in this Presidency is generally of an inferior description. The names of the local varieties are given in the detailed statement herewith forwarded.

5. The average wholesale prices of wheat per cwt. reported by Collectors are as follows :—

		Rs.	A.	P.	
Kistna	... ...	5	4	0	per cwt.
Cuddapah	... ...	4	5	7	„
Bellary	... Between	3	12	0	& 2-12-10 per cwt.
Kurnool	... ...	4	13	8	per cwt.
Coimbatore	... ...	3	0	0	„
Nilgiris	... ...	5	13	4	„
Godavery	... ...	4	5	0	„

6. Wheat is consumed in small quantities by the higher classes a a luxury on the occasion of festivities, and is not a staple food. There are no data for making even a rough estimate of the quantity consumed in this Presidency, the figures furnished by Collectors and shown in the accompanying statement being evidently purely conjectural.

7. The following statement shows the exports and imports by sea in 1876-77 :—

District.	Imported from					Exported to				
	Foreign ports beyond India.	Ports in other Presidencies.	Ports within the Presidency.	Indian ports not British.	Total.	Foreign ports beyond India.	Ports in other Presidencies.	Ports within the Presidency.	Indian ports not British.	Total.
1	2	3	4	5	6	7	8	9	10	11
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Ganjam ...	...	7	...	..	7	...	...	1,894	...	1,894
Vizagapatam ...	...	...	...	...	...	...	20	8,783	...	8,812
Godavery ...	...	4	79	...	83	201	6	74	15	296
Kistna ...	...	3	15	...	18	...	...	4,104	...	4,104
Nellore ...	...	...	31	...	31	...	...	170	...	170
South Arcot ...	29	410	56	...	495	29	...	...	...	29
Tanjore ...	40	347	394	145	926	132	...	37	379	548
Madura ...	...	45	57	...	102	...	...	28	...	28
Tinnevelly ...	...	1,505	12	...	1,517	233	...	...	...	233
South Canara ...	...	4,981	447	...	5,428	...	343	658	...	1,001
Malabar ...	...	43,356	5,567	961	49,884	3,870	4,497	5,118	120	13,605
Madras ...	22	54,466	10,687	...	65,175	4	...	500	...	504
Total ...	91	105,124	17,345	1,106	123,666	4,469	4,875	21,366	514	31,224

Particulars of Columns 2, 3, and 5.			Particulars of Columns 7, 8, and 10.		
Places beyond the Presidency from which imported.		Quantity.	Places beyond the Presidency to which exported.		Quantity.
		Cwt.			Cwt.
Bengal		50,498	Ceylon		4,308
Bombay		52,897	Straits Settlements ...		161
Burma		831	Bombay		4,846
Scinde		898	Burma		29
Cutch		961	Travancore		120
Pondicherry		145	Pondicherry		394
Ceylon		91			
Total ...		106,321	Total ...		9,858

The estimates of exports and imports by land as given by the Collectors are shown in the detailed statement, but the Board have no means of testing their accuracy.

It will be seen that both the exports and imports by sea are insignificant, and that relatively the latter are greatly in excess of the former.

8. Information regarding the cost of carriage is given in the detailed statements and the districts from which there are exports; but, as already stated, the exports for the whole Presidency are altogether insignificant, and comment does not appear called for.

Statement showing information tabulated from the replies received from Collectors regarding wheat cultivation—*Vide* Board's Proceedings, dated 1st May 1877, No. 2015.

District.	The area (in acres) under wheat in each of the last five years to the end of 1876-77.	The average outturn, in pounds, per acre.	A brief account of the cultivation showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.	Average wholesale price of wheat.	Average consumption per head of the population of the district.	Total consumption within the district.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Kistna ...	YEARS. ACRES. Fasli 1282 (1872-73) ... 2,016 „ 1283 (1873-74) ... 2,180 „ 1284 (1874-75) ... 2,219 „ 1285 (1875-76) ... 2,145 „ 1286 (1876-77) ... 2,186 Wheat is grown chiefly in Bapatla Taluk and to a slight extent in Repalli, Guntoor, Narsarowpet, Gudivada, Bunder, and Bezwada Taluks. It is reported that this crop is also grown to a small extent in the Nuzvid zemindari; but, as no accounts are available, the area is unknown.	LBS. 384 480 480 288 96 Average 346	Regur or black cotton and mixed cotton or alluvial soils are preferred for the cultivation of wheat. The quantity of seed sown per acre varies from 20 to 45 lbs. Land kept for wheat is not sown with an early crop, but is left fallow till October, the sowing time. It is generally put into land which has borne dry paddy or varagu in the preceding year. Before wheat is sown, the land selected is well manured and ploughed over and over again; and in October the seed is sown by means of a drill plough. When the plant has risen above the ground to the height of a span or so, it is harrowed once and the crop is weeded twice or thrice. Wheat is harvested in the latter part of December or of January. It is considered a late crop and does not require much rain, as its growth is said to depend much on the usual damp winds, which set in about the end of the north-east monsoon.	Rs. 89 per putty equivalent to 1,920 lbs., or nearly 9 pies per lb. or Rs. 5-4 per cwt.	Wheat is used only by the richer classes on the occasion of any treat or festival. The average consumption per head of the population cannot be ascertained, and is very insignificant.	Correct information cannot be ascertained; consumption however is very limited.
2. Cuddapah ...	YEARS. ACRES. Fasli 1282 (1872-73) ... 1,783 „ 1283 (1873-74) ... 3,078 „ 1284 (1874-75) ... 4,160 „ 1285 (1875-76) ... 2,283 „ 1286 (1876-77) ... 1,414 Wheat is chiefly grown in the talukas of Kadiri, Pulivendla, and Madanapalli. It is also grown in Prodatur, Jamalamadagu, Voilpad, Royachoti, and Cuddah.	Average 750 lbs. The maximum is reported to be 1,440 lbs.	There is nothing peculiar as regards the mode of cultivation of wheat as contrasted with other grains. The land is ploughed in, the ordinary way, and the usual manures are applied. The seed is either drilled in like ragi or beans and cross-harrowed when it comes up, or else sown broadcast. The latter is the usual plan. Wheat is grown on (*a*) cotton soil (black regur), (*b*) dark loam, and (*c*) a mixture of red and cotton soil. These are named in the order of preference. Wheat also flourishes upon the deep black loamy soil formed upon the hill ranges. There is, however, very little cultivation of this kind upon the hills of this district, owing to their being almost uninhabited. A superior quality is produced in land which is irrigated. The quantity of seed sown per acre is stated to vary from 12 to 72 lbs. Wheat is ordinarily sown in dry lands after a crop of cholum, horse-gram or cotton, and in wet after a crop of ragi or paddy. The season for cultivation is about December, and that of harvest April.	About Rs. 87 per ton, or Rs. 4-5-7 per cwt.	Consumption limited to the wealthier Hindus and Mahomedans. The average per head on these classes is 4½ lbs., and on the total population is 1½ lbs.	Believed to be about 8,000 cwts. per annum; but there are no reliable data upon which to calculate the exact quantity.

N.B.—The continuation of this table, from columns 8 to 13, will be found on page 46.

Statement showing information tabulated from the replies received from Collectors regarding wheat cultivation, &c.—*continued.*

District.	The area (in acres) under wheat in each of the last five years to the end of 1876-77.	The average outturn, in pounds, per acre.	A brief account of the cultivation showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.	Average wholesale price of wheat.	Average consumption per head of the population of the district.	Total consumption within the district.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3. Bellary ...	YEARS. ACRES. Fasli 1282 (1872-73) ... 3,564 „ 1283 (1873-74) ... 6,269 „ 1284 (1874-75) ... 3,338 „ 1285 (1875-76) ... 3,387 „ 1286 (1876-77) ... 1,907 Wheat is grown in all the taluks, though not extensively.	Average 193 lbs.	Wheat is grown chiefly on dry lands, but regada and alluvial soils are preferred. No crop precedes it in the same year. The sowing commences in Hingari (rabi) season in the latter part of October and in November. It is harvested in January, February, and March. It is occasionally raised in wet lands in the Hingari season, preceded by cholum and korra as Momgari (Kharuff) crops. The produce of the dry land is the best. The quantity of seed sown per acre is 20 lbs. or 10 lbs.; 13 lbs. or 14 lbs. are required for wet lands.	15 to 20 seers (of 80 tolahs) per rupee, or between Rs. 3-12 and Rs. 2-12-10 per cwt.	This cannot be calculated, as it does not form the staple food of the district, being used occasionally by the higher classes as a delicacy at festivals.	This information cannot be provided for the reasons stated in column 6.
4. Kurnool ...	YEARS. ACRES. Fasli 1282 (1872-73) ... 6,323 „ 1283 (1873-74) ... 8,083 „ 1284 (1874-75) ... 7,835 „ 1285 (1875-76) ... 5,557 „ 1286 (1876-77) ... 1,087 Wheat is grown in all taluks except Markapur.	In the six taluks on this side of the Nallamalais, a fair average yield is 600 lbs. an acre. If the land is properly prepared and manured, it may amount to 960 lbs. For Cumbum the outturn is reported to be 135 lbs. This is small, but the soil is poor.	Land enriched by accumulation of silt is best fitted for wheat cultivation; regada and mosab lands, with an intermixture of chondu (saline earth), is also good. The quantity of seed required to sow an acre is given differently for different parts, varying from 22 lbs. to 48 lbs. The season for sowing extends from the middle of October to the first week of December. The cost of cultivation may be stated to be Rs. 7-13 per acre.	Average wholesale price of wheat per garce of 3,200 Madras measures during the past ten years is as follows:— 1867-68 ... 510 1868-69 ... 385 1869-70 ... 435 1870-71 ... 727 1871-72 ... 491 1872-73 ... 544 1873-74 ... 422 1874-75 ... 291 1875-76 ... 313 1876-77 ... 509 Average for the last five years Rs. 416, or Rs. 4-13-8 per cwt.	7 lbs. a head. Wheat is used as a luxury by the higher classes, and is not a staple food.	About 2,880 tons (per annum). *N.B.*—This is the figure given by the Collector. It is arrived at evidently by multiplying 7 lbs. by the entire population. But as but a small proportion of the population consume wheat, the estimate is evidently wrong.

5. Coimbatore...	Years. Acres. Fasli 1282 (1872-73) ... 2,312 ,, 1283 (1873-74) ... 2,526 ,, 1284 (1874-75) ... 2,235 ,, 1285 (1875-76) ... 2,108 ,, 1286 (1876-77) ... 1,661 Wheat is grown chiefly in the taluks of Coimbatore and Palladum.	516 lbs. per acre. The outturn in the several taluks varies from 602 lbs. to 107 lbs.	Black soil is usually selected for the cultivation of wheat. Wheat is grown only on garden lands, *i.e.*, lands irrigated by wells. The quantity of seed sown per acre varies from 14½ to 40 lbs.	Rs. 3 per cwt.	219 lbs. per head per annum.	3,916 cwt.
	In Coimbatore and Palladum taluks wheat usually follows cholum or ragi; but in Oodumulpettah taluk it follows cotton, Bengal gram, thenay or ragi. In the other wheat taluks there is no fixed rule. The season of cultivation in Coimbatore is the end of October and the beginning of November; Palladum October and November; Oodumulpettah the end of April and May; Erode October and November; Dharapuram November; Collegal June; and Bhowany July or August. The season of harvest in Coimbatore is March; Palladum January and February; Oodumulpetta September; Erode January or February; Dharapuram March; Collegal October; and Bhowany December or January. Herds of sheep and goats are located on the land to manure it. The land is ploughed up from 3 to 8 times, according to the nature of the soil, 2 or 3 months before sowing the seed. Before sowing the seed the land is watered, and is once more ploughed. The land is watered immediately after the seed is sown and again on the third day. The seed sprouts within about 10 days and the plants come into ear in about 3 months, and take from 4 to 6 months from the date of sowing to mature. The fields are weeded once or twice about a month after sowing. When the plants have grown to a height of 6 inches the field is harrowed. The land is watered (if there be no rain) at least once a week until the crop ripens. Water is not, however, allowed to stagnate in the land. After the crop comes to maturity, watering is discontinued for about 10 or 15 days; and when the ground gets dry, the crop is harvested. Besides sheep and goat manure, cowdung is also used. About 20 cart-loads of manure are required per acre. If the water used for the irrigation of wheat fields be brackish, the land is said to yield an increased outturn.						
6. Nilgiris ...	Years. Acres. 1872-73 ... 3,412 1873-74 ... 3,098 1874-75 ... 3,227 1875-76 ... 3,199 1876-77 ... 3,226	600 lbs. of cleaned wheat.	About 42 lbs. of seed wheat is sown per acre. Wheat and barley are alternately grown. April and the next four months are the season of cultivation. The land is first manured and then ploughed twice before sowing. It also harrowed some time after sowing. The ploughing and sowing is finished in three or four days, after which little or no attention is given to the crop until the harvest. The crop matures in four months. The grain is generally thrashed, but sometimes a flail is used.	Rs. 500 per garce of 3,200 Madras measures, or 5-13-4 per cwt.	50 lbs. of cleaned wheat per head of the indigenous population per annum.	22,000 cwt.
7. Godavery ...	Years. Acres. Fasli 1281 (1871-72) ... 31 ,, 1282 (1872-73) ... 29 ,, 1283 (1873-74) ... 17 ,, 1284 (1874-75) ... 27 ,, 1285 (1875-76) ... 289 ,, 1286 (1876-77) ... 6	125 lbs.	Ten seers or 20 lbs. of seed are sown on an acre. It is generally sown in November and December.	13 seers per rupee, or Rs. 4-5 per cwt.	Wheat is not used for food by the natives generally. It is used by the richer classes for confectionary.	

Statement showing information tabulated from the replies received from Collectors regarding wheat cultivation, &c.—*continued.*

District.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail, or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment by rail, by road, and by river.	Local names for the varieties of wheat cultivated, and their description in English.	General remarks.
	(8)	(9)	(10)	(11)	(12)	(13)
1. Kistna ...	YEARS. CWT. 1872-73 from British ports in the Presidency to Masulipatam ... 84¾ 1873-74 do. do. ... 51 1874-75 do. do. ... ... 1875-76 do. do. ... 19½ From British ports in Bombay Presidency to Masulipatam ... 15 From Calcutta to Masulipatam ... ... 3 These imports are by sea. There were some imports by land from His Highness the Nizam's dominions, but their correct quantity cannot be ascertained, but is supposed to be small.	YEARS. CWT. QR. LB 1872-73 ... 92 2 14 1873-74 ... 66 2 24 1874-75 ... 4,961 1 25 1875-76 ... 2,906 3 10 1876-77 ... 4,105 1 8 British ports within the Presidency and Jafna. There was export by road. Correct quantity exported by road is not to be got, but it is believed to be small. There is no rail, nor was any quantity carried by river.	No railway station near the district.	Information not given by the Collector.	Wheat is of two kinds—one is called Potti Godumulu, short wheat; and the other is Podugu Godumulu, long wheat. The one is reddish in colour; the other long, thin, and brown in appearance.	The growth and consumption of wheat is very small indeed, and the Collector doubts whether it is in any way a crop to which the ryots should be advised to turn their attention. Compared with English wheat, it is a stunted miserable-looking crop, and the grain is about half the size of that grown in England. The average area of wheat cultivation is 2,149 acres out of a total cultivated area of 1,707,619 acres.
2. Cuddapah ...	YEARS. CWT. 1872-73 ... ... 8,680 1873-74 ... ... 8,880 1874-75 ... ... 8,846 1875-76 ... ... 8,427 1876-77 ... ... 8,342 The places from which wheat was brought were Bellary district, Kurnool, Sholapore, Hyderabad country, and North-West Provinces.	YEARS. CWT. 1872-73 ... 10,350 1873-74 ... 9,577 1874-75 ... 9,011 1875-76 ... 8,388 1876-77 ... 209 Places whither exported were chiefly Bangalore and Bellary. Quantity of transport by rail is to the quantity of transport by road as 19 : 1.	As the railway passes through a portion and close to the remaining parts of the wheat-producing taluks of the principal division, the ryots bring the grain down from the villages, or else the merchants cart from the towns at which they reside. The cost per ton is Rs. 2. The wheat grown in the Mada-	The cost of transit to port of shipment (Madras) of course varies according to the point from which it is brought to the rail and the station at which it is loaded. The cost of carting is Rs. 2 per ton for 60 miles; that of carriage by rail is 8 pies per ton per mile. Taking two of the longest routes, the	(1) Java Gothumalu. (2) Budda Gothumalu. (3) Thavathkain Gothumalu. (1) is raised in wet lands and is considered the best, its flour being very rich in gluten. (2) is of an inferior kind grown on dry lands; derives its name from the globular shape of the grain.	The figures given as to the outturn of wheat and rate of consumption must be accepted with reservation. The Collector observes that he has not been able to obtain any satisfactory explanation as to the very large quantity of wheat grown in the district which remains unaccounted for. If the figures reported

			napalli taluk is carried to the rail at Gudiathum, a distance of 60 miles; and the cost of carriage would therefore be Rs. 12. Carrying from Pulivendla in the main division, 24 miles, would cost Rs. 4-8 per ton.	tual cost of carriage without charges for loading and unloading would be from Pulivendla to Maddras *viâ* Muddanoor station Rs. 12-8 per ton; from Madanapalli to Madras *viâ* Gudiathum station Rs. 16 per ton.	(3) is intermediate in quality between No. 1 and No. 2, and is called Padamati Gothumalu (western wheat), having been brought from from Sholapore originally.	were correct, the export *plus* consumption should balance or nearly balance the annual outturn *plus* imports, which is not the case.
3 Bellary ...	It is imported into this district from the north of the Tungabhudra (Raichur, Sholapur, Goolburga, Secunderabad, Poona, Bombay, Jubbulpore and Nagpore). The actual imports for five years have been 30,000,000 lbs.	Not reported ...	From Gooty, Tadpatry, and Adoni the cost of carriage is 6 annas, 2 annas at Bellary, and Rs. 1¼ at Alur.	.....	The local names of the varieties of wheat cultivated are— (*a*) Salaka ... (*b*) Java ... (*c*) Budda ... (*d*) Tani ... (All Telugu names.) The English equivalents for these are not known.	The Collector is of opinion that no artificial stimulus to the production of wheat is called for. There is abundance of land suited for wheat, especially in the subdivision which is well provided with road communications with half a dozen railway station. There are agencies of European and other large firms in Alur, Adoni, Tadpatry, Gooty, and Belary.
4. Kurnool ...	No reliable information is available. The quantity is assumed to be 783 tons, which is the difference between the quantity consumed and that raised in the district.	No exports ...	.....	.....	The different kinds of wheat grown are (1) Salaku or Mondigalu; (2) Buddalur Pattalu; and (3) Yavalu. (1) large, long, hard, and of dark-brown colour, and is the best of all. The flour is fine, white, and, when mixed with water, is very cohesive. (2) short, smaller in size than (1), of a lighter colour; its flour is less white and cohesive, and used only for making coarse bread. (1) and (2) are said to grow out of the same kind of seed sown on different kinds of soil, *i.e.*, unirrigated and moist lands respectively. (3) Otherwise called garden wheat, inferior to (2), of a light brown colour, larger than (2), but much thinner and very pointed at the ends, and its flour is not cohesive and is not much prized.	
5. Coimbatore ..	YEARS. CWT. 1872-73 from Bombay ... 562½ Do. do. Calicut ... 562½ Do. do. Salem ... 1,466 Do. do. Bangalore 72 1873-74 do. Bombay ... 884 Do. do. Calicut ... 884 Do. do. Salem ... 1,446 Do. do. Bangalore 72 1874-75 do. Bombay ... 482 Do. do. Calicut ... 482 Do. do. Salem ... 1,418	Exports in— Cwt. 1872-73 ... 9,919 1873-74 ... 7,901 1874-75 ... 6,762 1875-76 ... 5,778 1876-77 ... 5,494 Total ... 35,854	Rs. 2-8-3 per cartload of 1,000 lbs.	Not available, as no wheat is carried to such ports direct by the merchants resident in the district.	Wheat is of 4 kinds:— (1) Sambah Godoomay. (2) Pottay Godoomay. (3) Hodday Godoomay. (4) Javay Godoomay.	

Places whither exported are Trichinopoly by rail, Bangalore by rail, Nilgiris by rail and road, Salem by rail and road, and Mysore by road.
26,199, or nearly $\frac{3}{4}$ of the total, were exported by rail and the rest by road.

Statement showing information tabulated from the replies received from Collectors regarding wheat cultivation, &c.—*concluded.*

District.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail, or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment by rail, by road, and by river.	Local names for the varieties of wheat cultivated, and their description in English.	General remarks.
	(8)	(9)	(10)	(11)	(12)	(13)
	Years. Cwt. 1874-75 from Bangalore 72 1875-76 do. Bombay ... 442 Do. do. Calicut ... 442 Do. do. Salem ... 1,453 Do. do. Bangalore 72 1876-77 do. Bombay ... 1,428½ Do. do. Calicut ... 1,213 Do. do. Salem ... 100 Do. do. Calcutta ... 446½ Do. do. Bangalore 72 Imports in— 1872-73 ... 2,663 1873-74 ... 3,286 1874-75 ... 2,514 1875-76 ... 2,409 1876-77 ... 3,260 Total ... 14,132					
6. Nilgiris ...	Unknown	None	To Coonoor, Rs. 6 per cart.	.....	There is but one variety of wheat grown.	
7. Godavery ...	Years. Cwt. 1872-73 ... ... 1,426 1873-74 ... ... 304 1874-75 ... ... 130 1875-76 ... ... 284 1876-77 ... ... 80 Wheat is imported from Calcutta and Bimlipatam.	None	.....	.....	The wheat produced in the district is called Desavuli or country wheat, and is not good for bread.	

Order thereon by Government of Madras.

Ordered, that the foregoing papers be forwarded to the Government of India, with reference to the latter part of paragraph 2 of letter from this Department No. 897, dated 12th June 1878.

Extract from the Proceedings of the Government of Madras in the Revenue Department,—No. 3271, *dated* 11*th June* 1877.

Read the following:—

Dated Madras, the 16th May 1877.

From—J. JONES, Esq., Chairman, Madras Chamber of Commerce,
To—The Chief Secretary to the Government of Madras.

I am desired, with reference to the Proceedings of Government of the 4th ultimo, to express the Chamber's regret that, as Southern India is not a wheat-producing country, it is out of their power to contribute to the information relative to the development and improvement of the Indian wheat trade which they are gratified to learn is being collected by the Government of India.

ORDER THEREON BY GOVERNMENT OF MADRAS.

Recorded.

No. 172921R., dated Bangalore, the 6th June 1878.

From—MAJOR T. G. CLARKE, Secretary to Chief Commissioner, Mysore,
To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of this office letter No. 795-12, dated 3rd ultimo, and previous correspondence, I am desired by the Chief Commissioner to submit the following report on the cultivation of wheat in Mysore, as called for in Government of India Resolution No. 1—47, dated the 14th March 1877.

2. The cultivation of wheat is carried on in nearly every district of the province, but the Chitaldroog district is that in which the cereal is most largely produced. In the Kadur district wheat is chiefly raised in the taluks of Banawar, Tarikere, and Chickmaglur. In the Shimoga district it is grown to a large extent in the Honnali taluk, and to a limited extent in the Shikarpur and Chennagiri taluks. In the Mysore district its cultivation is restricted to the taluks of Nunjungud, Chamrajnagar, Gundlupet, and Talkad, and in the Hassan district to the taluks of Hassan, Arkulgud, Channaroyapatna, Haruhally, and Nursipur. In the Bangalore and Tumkur districts wheat is grown in very few localities, while in the Kolar district it is cultivated in eight out of the eleven taluks, *viz.*, Kolar, Betmangala, Shrinivaspur, Mulbagal, Sidlagutta, Malur, Gumnayakanpalya, and Goribidnur.

(1) the names of the districts in which wheat is grown.

3. The area cultivated with wheat in each of the last five years and the average outturn per acre are shown in the appended statement (No. I).

(2) the area (in acres) under wheat in each of the last five years to the end of 1876-77; and (3) the average outturn in lbs. per acre.

4. It will be seen from the statement (No. I) that there has been a large decrease in the area under wheat cultivation during the last two years, owing apparently to the unfavourable season, the extent cultivated in 1876-77 being less than half of that cultivated in 1874-75.

5. The information required under this head will be found at pages 99 to 101 of the *Mysore Gazetteer*, Volume I: a copy of the passage is appended to this letter.

(4) a brief account of the cultivation, in which should be stated the kind of land preferred, the quantity of seed sown per acre, the crops which wheat follows, the season of cultivation, and other useful particulars.

6. The appended statement (No. II) shows the average quantity of wheat sold per rupee during the last six years.

7. The high prices obtained for wheat in 1876-77 and 1877-78, as shown in the foregoing statement, were owing to the prevailing famine.

(5) the average wholesale price of wheat;

(6) the average consumption per head of the population of the district; and

(7) the total consumption within the district.

8. The total consumption of wheat within each district and the average consumption per head of the population are shown in the appended statement (No. III).

9. The total population of the province, according to the census of 1871, is 5,055,412 (now very greatly reduced), which, contrasted with the total consumption of wheat amounting to 5,649,946 lbs., gives an average of 1 lb. 1 oz. per head. The average would, as the population now stands, be higher. If the consumption of this article by the European communities of the large towns be excluded, this average would necessarily be much reduced.

10. Wheat is not consumed to a large extent by the natives of this province, who generally use it as an article of luxury on special occasions, such as marriages, festivals, and other entertainments. In the town of Bangalore, where wheat is consumed to a large extent by the European community, the average consumption is estimated at 20 lbs. per head.

11. The total quantity of wheat imported into the province during the last five years amounted to 24,952,820 lbs., or an average of 4,990,564 lbs. per annum, as shown in the appended statement (No. IV).

(8) annual imports into the district for five years, and places whence imported.

12. There were no exports except from the Chitaldroog and Kolar districts, and to a small extent from the Tumkur district. The total quantity of wheat exported during the past five years amounted to 7,029,600 lbs., or an average of 1,405,920 lbs. per annum, as exhibited in the appended statement (No. V).

(9) annual exports for the same period, places whither exported, and proportion carried by road, rail, or river.

13. The ordinary rates of cart hire to the Bangalore terminus of the Madras Railway from the several district head-quarters are shown below:—

(10) the estimated average cost of cartage to the railway station nearest the province.

District head-quarters.	Distance to Bangalore.	Rate per mile.	Amount. Rs.	A.	P.
Tumkur ...	43 miles	1½ annas	4	0	6
Shimoga ...	171 „		16	0	6
Chickmaglur ...	150 „		14	1	6
Chitaldroog ...	123 „		11	8	6
Hassan ...	115 „		10	12	6
Mysore ...	87 „		8	2	6
Kolar ...	43 „		4	0	6

14. The principal port from which wheat can be exported is Madras, which is distant 216 miles by rail. The charge for conveyance of grain by the Madras Railway is 6 pies per ton per mile.

(11) cost of transit to port of shipment (Calcutta, Bombay, or Kurrachee) by rail, by road, and by river.

15. There are two kinds of wheat cultivated in Mysore, *viz.*, "hotle godhi" (*triticum spelta*) and "jave godhi" (*triticum monococum*). The latter grain is considered to be of the superior quality.

(12) local names for the varieties of wheat cultivated, and their description in English.

16. The samples of wheat grown in the various taluks which have already been submitted to the Government of India from time to time are noted in the accompanying statement, which also embodies the opinion of the Superintendent of the Government Experimental Farm as to the character of each sample.

17. The opinion of the agent to the bakery (recently established at Bangalore by a Mr. McGregor of Dundee) as to the character and value of two of the locally-grown samples which were submitted for his inspection is as follows: "I beg to remark that the sample marked 'jave godhi,' grown in the Nursipur taluk, Hassan district, is exceedingly well adapted for the purpose of bread manufacture. Though not so large in the bulk of grain as the wheat from Sholapur and Dharwar, which are considered very superior kinds, yet, judging from its firmness and apparent solidity, I have no hesitation in saying that this wheat would compare very favourably indeed in any experiments that might be made in making bread from the same quantity of either kind. I would, however, remark that the specimen wheat is not cleaned sufficiently as a marketable commodity. The other specimen marked 'hotle godhi' would never become popular as a bread-wheat. The colour is not only against it, but it appears to be wanting in that softness which is the main attribute of the other, and of all good bread-wheats.

18. The total area cultivated with wheat during the past five years amounted to 55,699 acres, which yielded 16,174,492 lbs., or an average of 290¼ lbs. per acre. The total quantity imported during the same period was 11,139 tons 13 cwts. 4 lbs., and that exported was 3,138 tons 4 cwts. 32 lbs.

(13) a general summary for the province showing the total area under wheat, the average outturn, and the details of the import and export trade.

Extract from the Mysore Gazetteer, *Volume I, pp.* 99-101.

Wheat.—There are two kinds cultivated, jave godhi (*triticum monococum*) and hotle godhi (*triticum spelta*). For the former, in Kolar, the ground is sometimes ploughed five times; and sometimes dug with the hoe called kolguduli to the depth of one cubit, which is reckoned preferable. In Jeshta (May-June) the seed is sown broadcast, and covered with the hoe. The channels and squares are then formed as for poppies, and the ground is smoothed with the hand and dunged; while such of the seed as may happen to be above the ground is pushed down with the finger. In forty-five days the field must be watered nine times. It is then weeded with the instrument called worarari; after which, one watering in six days suffices. It ripens in three months,

is cut, tied up in small sheaves, and stacked for four days. It is then dried one day in the sun, and thrashed out by beating the sheaves against a log of timber. To separate the awns, the grain is then beaten with a stick. In the fields of wheat, radishes are planted on the mounds which divide the squares.

In the black clay in Madgiri wheat of the kind called jave godhi is the most common crop. It is but a poor grain, and five-twelfths of it consist of husks. Any time in Pushya (December-January) plough once ; next day, if there be no rain, water the field and plough again across, dropping the seed in the same manner as in sowing jola. The plots must be formed in the same manner. It gets no manure nor weeding, and requires only three waterings, on the fortieth, sixtieth, and eightieth days. It is much subject to disease, and not above one crop in four is good. After reaping the wheat, the field, in order to expose the soil to the rain, must be immediately ploughed.

In Sira, in place of the Vaisakha crop, when there is a scarcity of water, wheat, both jave and hotle, are sown on rice lands. These grains may be followed by a Kartika crop of ragi ; but by this process the ground is as much exhausted as if it had been sown with navane. If the Kartika crop be altogether left out, the Vaisakha crop of rice following wheat will be as good as if the ground had been regularly cultivated for rice alone ; and in India it is a commonly received opinion that, where a supply of water admits of it, ground can never be in such good heart as when regularly cultivated by a succession of rice crops. Wheat requires a clay soil, and the manner of cultivating both kinds is the same. In the two months preceding, and the one following the antumnal equinox, plough five times. In the following month, after a rain, or after having watered the field, plough again, and drop the seed into the furrows. Then divide it into squares, as for jola, and water it once a month. The straw is only used for fire. If given to cattle for fodder, it is supposed capable of producing the distemper.

A very small quantity of the wheat called jave godhi is raised near Periyapatna on fields of a very rich soil, from which alternate crops of kadale and of it are taken. The manure is given to the kadale ; but wheat requires none. From the winter to the summer solstice plough once a month. Then in the following month plough twice, sow broadcast, and cover the seed with the plough. It ripens in four months without further trouble. The seed required for an acre is about 4·7 pecks ; the produce is 10 seeds, or rather less than 12 bushels.

The wheat raised near Nursipur in the Mysore district is of the kind called hotle godhi, and there are two seasons for its cultivation, the hain and kár. It is sown on the best soil only, and always after a crop of kadale. The kár season, when the rains set in early, is always preferred, not only as the wheat is then more productive, but as in the same year it may be followed by a crop of cotton, which is not the case with the hain wheat. In the two months following the vernal equinox, the field for kár wheat is dunged, ploughed two or three times, and then hoed with the kunte, which is drawn by oxen. The seed is then sown, in drills one cubit distant, by dropping it in the furrow after a plough. On the fifteenth, twenty-eighth, and thirty-fifth days the hoe is again used,

and two or three days afterwards the weeds are removed by the kale kudagalu. This wheat ripens in three months and a half, and is immediately followed by a crop of cotton. A nur-kamba requires seven kolagas of seed, and in a good crop produces 540 seers. An acre, therefore, sows a little more than one peck, and yields almost four bushels and a half. The wheat is liable to be spoiled by a disease called arsina mári, owing to which, in the course of one day, it becomes yellow and dies.

When the rains are late in coming, the hain crop of wheat is taken after kadale. Cotton cannot be taken in the same year. The manner of cultivation is the same as for the kár crop, only the season is different. The ploughings are performed in the month which precedes the autumnal equinox, or in the beginning of that which follows. At the end of this month the seed is sown. The produce is about one-half only of that of the kár crop.

No. I.

Statement showing the area cultivated with wheat during the five years ending 1876-77, and the average outturn per acre.

District.	Area, in acres.						Average outturn, in lbs., per acre.	Total outturn, in lbs.	Remarks.
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Total.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Chitaldroog ...	7,172	6,799	7,404	4,960	1,168	27,503	193	5,308,079	The average outturn per acre in the various taluks during the past five years is stated to vary from 10 to 320 lbs.
Shimoga ...	970	960	954	965	963	4,812	450	2,165,400	
Kadur ...	2,550	2,600	2,500	2,000	2,000	11,650	54	629,100	The Kadur Deputy Commissioner states that these figures are taken from the statistical returns; but, according to special information called for, the average area cultivated annually was only 559 acres, and the average outturn per acre varied from 64 to 600 lbs.
Bangalore ...	300	300	300	300	300	1,500	2,700	4,050,000	The Deputy Commissioner of Bangalore has only given the total area cultivated during the past five years, and not the actual area cultivated in each year.
Kolar ...	248	278	293	124	80	1,023	1,600	1,636,800	The Kolar Deputy Commissioner states that in the Mulbagul, Malur, Betmangala and Goribidnur taluks where the soil is inferior, only 800 lbs. may be taken as the average outturn per acre; though it is to be added that in the Goribidnur taluk, owing to the sandy character of the lands, any figure above 600 lbs. is very seldom, if at all, reached.
Tumkur ...	120	120	120	120	120	600	1,800	1,080,000	The Tumkur Deputy Commissioner states that the cultivation of wheat is but little followed in his district, the whole area so cultivated not exceeding 120 acres during the last five years ending 1876-77.
Mysore ...	1,123	1,559	1,893	1,689	1,644	7,908	144	1,120,224	The average outturn during past five years varied from 130 to 192 lbs. per acre.
Hassan ...	74	174	189	242	24	703	263	184,889	The average outturn in the various taluks is said to vary from 400 to 40 lbs. per acre, the ordinary yield being from 200 to 240 lbs.
Total ...	12,557	12,790	13,653	10,400	6,299	55,699	290½	16,174,492	

N.B.—The figures in column (9) have been calculated by multiplying those in columns (7) and (8).

R. P. THUMBOO CHETTY,
for *Secretary*.

No. II.

Statement showing the average quantity of wheat sold per rupee during the six years ending 1877-78.

District.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	Remarks.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
Chitaldroog	23·2	24	38	24·6	12	14	Wholesale.
Shimoga	16	24	24	24	10·4	8·4	Retail sale
Kadur	28	20	24	18	8	12	Ditto.
Bangalore	16	24·4	27	21·4	14	16·4	Wholesale
Kolar	19	...	...	...	...	17	Ditto.
Tumkur	19	25	25	24	13	18	Ditto.
Mysore	19	23	26·2	19	14·6	7	Ditto.
Hassan	18	25	21	20	12·4	12	Retail sale.

N.B.—The prices shown in this statement are those obtained in the last fortnight of each official year.

R. P. THUMBOO CHETTY,
for *Secretary*.

No. III.

Statement showing the total consumption of wheat within each district, and the average consumption per head of the population.

District.	Population.	Total consumption per annum within the district.	Average consumption per head of the population of the district.		Remarks.
(1)	(2)	(3)	(4)		
		lbs.	lbs.	oz.	
Chittaldroog	531,360	533,084	1	0	
Shimoga	498,976	687,600	1	6	
Kadur	333,925	229,432	0	11	
Bangalore	828,354	1,920,000	2	5	
Kolar	618,954	215,120	0	5½	
Tumkur	632,239	554,100	0	14	
Mysore	943,187	1,247,232	1	5	
Hassan	668,417	263,378	0	6	
Total ...	5,055,412	5,649,946	1	1	

N. B.—The figures in column (4) have been calculated by dividing the figures in column (3) by those in column (2).

R. P. THUMBOO CHETTY,
for *Secretary.*

No. IV.

Statement showing the total quantity of wheat imported during the five years ending 1876-77.

District.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Total.	Places whence imported.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Chitaldroog ...	1,972,960	1,610,000	1,588,200	815,800	710,400	6,697,360	From districts within the province ... ... 390,000 From foreign districts 6,307,360 6,697,360
Shimoga ...			Details not given.			2,818,880	Harihar, Kadur, and Ajjumpur in Mysore, and Rani Bemur and Tummanagatte in the Dharwar district, Bombay.
Kadur ...	141,800	107,880	104,300	113,680	50,400	518,060	Shimoga and Chitaldroog districts of Mysore and Dharwar Collectorate of the Bombay Presidency.
Bangalore ...	3,119,040	773,760	2,050,240	1,028,800	1,890,560	7,062,400	Chitaldroog and Bellary districts and to a small extent from Goribidnur taluk of the Kolar district.
Kolar ...	157,760	157,480	165,480	182,040	182,040	845,400	From taluks within the district ... ... 34,020 From other districts within the province ... 404,720 From Her Majesty's territory 405,760 845,400
Tumkur ...			Details not given.			762,560	Chitaldroog and Bangalore districts and parts of the Bellary Collectorate.
Mysore ...	1,120,000	1,151,360	1,086,400	958,720	799,680	5,116,160	Bellary and Bangalore.
Hassan ...	247,200	241,200	231,200	239,200	173,200	1,132,000	Tiptur, Davengeri, Chickmaglur, Bellary, &c.
					Total ...	24,952,820	
Average per annum ...	...	...	...	...	...	4,990,564	

R. P. THUMBOO CHETTY,

for *Secretary.*

No. V.

Statement showing the total quantity of wheat exported during the five years ending 1876-77.

District.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Total.	Places whither exported.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.		lbs.
Chitaldroog ...	1,750,000	283,000	1,720,000	2,020,000	1,110,000	6,883,000	To other districts in the province	6,523,000
							To foreign districts	360,000
								6,883,000
Kolar ...	27,200	27,560	27,840	24,000	24,000	130,600	To other taluks in the district	30,000
							To other districts in the province	70,000
							To foreign districts	30,600
								130,600
Tumkur ...			Details not given.			16,000	From Sira Taluk towards Bangalore.	
					Total ...	7,029,600		
Average per annum ...	...	...	...	...	...	1,405,920		

R. P. THUMBOO CHETTY,

for *Secretary*.

No. VI.

Statement showing the samples of wheat grown in the various taluks of the Mysore Province which were submitted to the Government in accordance with the instructions in their Resolution No. 1—47, dated 14th March 1877.

Division.	District.	Taluk.	Packet No.	Kind of wheat.	Remarks as to the character of each sample by the Superintendent of the Government Experimental Farm, Bangalore.
Nundydroog ...	Kolar District ...	Kolar ...	1	Jave godhi ...	Hard, bright grain, of excellent quality, fairly grown.
Ditto ...	Ditto	Betmangala ...	2	Ditto ...	Hard, small, uniform, well filled, well grown.
Ditto ...	Ditto ...	Mulbugul ...	3	Ditto ...	Hard, badly grown grains, not well filled.
Ditto ...	Ditto ...	Malur ...	4	Ditto ...	Hard, fairly grown.
Ditto ...	Ditto ...	Sidlagatta ...	5	Ditto ...	Hard, well grown.
Ditto ...	Ditto ...	Goribidnur ...	6	Ditto ...	Hard, badly grown grains, not well filled.
Ditto ...	Ditto ...	Ditto ...	7	Hotle godhi ...	Hard, fairly grown, opaque.
Ditto ...	Ditto ...	Gumnaya Kenpalya ...	8	Jave godhi ...	Hard, very well grown, well filled.
Ditto ...	Ditto ...	Ditto ...	9	Ditto ...	Hard, well grown, well filled.
Ditto ...	Bangalore ...	Ditto ...	10	Hotle godhi ...	Hard, well grown, dark colour, dirty sample, opaque, less flinty.
Nagar ...	Kadur District ...	Tarikere ...	3	Jave do. ...	Softer and less flinty than the jave godhi variety.
Ditto ...	Ditto ...	Ditto ...	4	Hotle do. ...	,, ,, ,, ,,
Ditto ...	Ditto ...	Chickmaglur ...	6	Jave godhi ...	Flinty, fine clean sample, well grown.
Ditto ...	Ditto ...	Banawar ...	14	Ditto ...	In husk, new sample, clean long thin grain.
Ditto ...	Shimoga ...	Chinnageri ...	2	Ditto ...	Good sample, small grain, clean and well grown, hard.
Ditto ...	Ditto ...	Honnali ...	1	Hotle godhi ...	Good quality, clear pump and well grown.
Ditto ...	Chitaldroog ...	Hiriur ...	7	Ditto ...	Fair sample, well grown, clean, well cleaned, dark skin.
Ditto ...	Ditto ...	Chitaldroog ...	9	Jave godhi ...	Fine grain, well prepared sample.
Ditto ...	Ditto ...	Hosdrug ...	8	Hotle do. ...	
Ditto ...	Ditto ...	Powghur ...	12	Jave do. ...	
Ditto ...	Ditto ...	Chitaldroog ...	13	Hotle do. ...	
Ashtagram ...	Hassan ...	Nursipur ...	1	Jave godhi ...	Badly cleaned, broken sample, of a highly flinty character.
Ditto ...	Ditto ...	Arkulgode ...	2	Ditto ...	Excellent sample, small grain, unhusked, translucent.
Ditto ...	Mysore ...	Ditto ...	1	Hotle godhi ...	
Ditto ...	Ditto ...	Talkad (in Moogoor vil.) ...	2	Jave do. ...	

R. P. THUMBOO CHETTY,
for *Secretary*.

No. 2373-29R., dated Bangalore, the 27th June 1878.

From—MAJOR T. G. CLARKE, Secretary to Chief Commissioner, Mysore,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of this office letter No. 1729-21, dated 6th instant, I am desired by the Chief Commissioner to submit, for the information of the Government of India, the accompanying copy of a statement received from the Madras Railway authorities, showing the quantity of wheat imported into Bangalore by rail between the years 1873 and 1877; and to state, in correction of certain particulars given in paragraph 14 of that letter, that the actual distance between Madras and Bangalore is 217 and not 216 miles, and that the rate charged by the Railway for conveyance of grain during the famine was 8 pies per mile.

Statement of wheat received at Bangalore station from the years 1873 *to* 1877.

RAILWAY STATIONS.	1873.	1874.	1875.	1876.	1877.	TOTAL.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Madras ...	1,485½	2,986	615½	2,782½	1,705	9,574½
Veerapoor ...	7,045½	2,383	...	...	...	9,428½
Bellary ...	1,038	...	...	1,259	116½	2,413½
Goolburga ...	...	...	197	1,120	...	1,317
Hyderabad ...	...	...	...	816	...	816
Sholapore ...	2,812½	6,118	13,584	19,705½	2,687	44,907
Morheh ...	...	260	314½	639	...	1,213½
Nagpore ...	...	...	...	...	508½	508½
Barsee Road ...	...	...	278	...	...	278
Hurda ...	...	...	...	...	1,066	1,066
Deoree ...	...	...	...	...	320	320
Chola ...	...	...	...	759½	...	759½
Secunderabad ...	...	...	...	3,718	3,555	7,273
Saugor ...	...	...	...	706½	...	706½
Jubbulpore ...	...	...	...	548½	855	1,403½
Bori Bunder ...	...	...	...	...	205	205
Tanoor ...	...	...	...	...	490½	490½
Beypore ...	...	...	...	4,287½	...	4,287½
TOTAL ...	12,381½	11,747	14,989	36,342	11,508½	86,968

W. H. JOHNSTONE,

Madras Railway.

No. 990-190, dated Rangoon, the 14th June 1877.

From—Major C. W. Street, Secretary to Chief Commissioner, British Burma,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to paragraph 5 of Resolution No. 1—46, dated the 14th March last, I am directed to report that the area of land under wheat cultivation in British Burma is very insignificant and limited to a single township in the frontier district of Thayetmyo, which borders immediately on Upper Burma. In the King's territory wheat is widely cultivated, and it is not improbable that, as population increases and communication becomes easier with the extension of the railway, many places in the Thayet district may be found favourable to the crop.

(1) the name of the district in which wheat is grown.

At present wheat is grown in the Isa Ein Circle of Thayetmyo District (Pegu Division).

(2) the area (in acres) under wheat in each of the last five years to the end of 1876-77.

1872-73	...	19 acres.
1873-74	...	59 „
1874-75	...	51 „
1875-76	...	11 „
1876-77	...	2 „
Total	...	142 „

Decreased cultivation in 1876-77 owing to falling off in the market price of wheat.

(3) the average outturn, in lbs., per acre.

The average produce per acre is estimated to be about 960 lbs.

(4) a brief account of the cultivation, in which should be stated the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.

Wheat is grown on the banks and alluvial deposits of streams: 128 lbs. or two baskets is the quantity sown per acre, and is generally cultivated the same time with gram, jute, and cotton, in the month of November and reaped by February.

(5) the average wholesale price of wheat.

No real average: the approximate is 64 lbs. or one basket at Rs. 2-8. This year (1876-77) in March Rs. 5 per basket has been paid; in 1875-76, fell as low as Re. 1.

(6) average consumption per head of the population.

Consumption almost entirely confined to the head-quarter town (Thayetmyo). Estimated 600 baskets of 64 lbs. per month, 3·7 lbs. per head.

(7) total consumption within the district.

Estimated at $600 \times 64 = 38,400 \times 12 =$ 460,800 lbs. annually.

(8) annual imports into the district for five years, and places whence imported.

Maunds 114,123, value Rs. 2,27,631, imported from Upper Burma by boats: the majority of this import finds its way down-stream for consumption in the several towns. Wheat imported by steamers and carried on direct to Rangoon is not included herein.

(9) annual exports for the same period, places whither exported, and proportion carried by road, rail, or river.

None exported, and proportion carried cannot be given.

(10) estimated average cost of cartage to the railway station nearest the district.

None exported, and cartage cannot be estimated.

(11) cost of transit to port of shipment by rail, by road, or by river.

None exported from this district, and cost of transit cannot be given.

(12) local names of the varieties of wheat cultivated, and their description in English.

Local name (1) shway-gyee-gyone; description in English, large golden grain: (2) byatgyone, black-grained wheat.

2. No wheat is grown in any other district of this province. A small experiment was tried by a native of India in the Toungoo district with only partial success; and in the Arakan Division the Commissioner reports that, though no attempt has ever been made in any part of the division to grow wheat, there are culturable plains of wide extent suitable to the cultivation, which he would be willing to try if supplied with seed. As before noticed, there is a considerable growth of wheat of excellent quality in Upper Burma beyond the British frontier. This is brought down in large quantities and supplies the wants of this province, while portions of it are exported by sea, chiefly to the Mauritius and the Straits Settlements, and in smaller quantities to the United Kingdom, Bengal, and Madras: *vide* statement of exports received from the Collector of Customs, Rangoon, enclosed. The extreme dampness of the lower district of British Burma is unfavourable to the cultivation, but in more northern districts the rainfall is very much less; and the Chief Commissioner is not without hope that, as railway extension developes the resources of this part of the country, the cultivation of wheat may find a wider expansion then.

Statement of wheat imported into the Province of British Burma from foreign ports and ports in other Presidencies, and ports within the Province of British Burma, from 1871-72 *to* 1875-76.

	Quantity.					Value.				
	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.
Imports from foreign ports—	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Rs.	Rs.	Rs.	Rs.	Rs.
Straits Settlements ...	...	...	110	...	...	...	...	1,012	...	...
Imports from other Presidencies—										
Bengal ...	4,489	3,006	9,571	602	1,466	17,955	12,026	58,324	2,650	4,864
Madras ...	...	...	153	2,315	198	...	...	612	9,259	792
Total ...	4,489	3,006	9,724	2,977	1,664	17,955	12,026	58,936	11,909	5,656
Ports within the Province ...	6,029	6,245	844	11,870	11,199	24,095	24,079	33,776	47,481	44,796

Rangoon Custom House; *The 11th April* 1877.

C. J. BROWN,
Collector of Customs.

No. 3898, dated Calcutta, the 24th November 1877.

From—A. MACKENZIE, Esq., Secy. to the Government of Bengal,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

Referring to the Resolution of the Government of India No. 1—41, dated the 14th March last, and its annexures, regarding the adoption of measures for improving the quality of wheat, I am now directed to report, for the information of His Excellency the Governor General in Council, that the papers were communicated to the editors of the leading newspapers and to the principal mercantile firms in Calcutta. They were also forwarded to Commissioners of Divisions, with a request that they would draw the attention of the District Magistrates to the instructions contained in paragraphs 3 and 4 of the Resolution.

2. As directed in paragraph 6, samples of wheat from each of the exporting districts of Bengal have already been forwarded to your office.

3. A statement showing the particulars indicated in paragraph 5 of the Resolution is herewith submitted. Only those districts have been included in the statement in which the cultivation covered an appreciable area; and as regards most of these, it is to be feared that the statistics entered by the Collectors in columns 2 to 9 are far from reliable. District officers in Bengal have really no means of giving such correct returns of cultivation, consumption, and district trade as are required. The figures in column 6 of 'average consumption per head of the population of the districts' are particularly meaningless in districts where wheat is not an ordinary staple of consumption; and even where it is, Collectors have no means of forming any reliable estimate. In column 13 a summary of information is given for the province, based on such material as is available.

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.	The average outturn in pounds per acre.	A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.	The average wholesale price of wheat.	Average consumption per head of the population of the district.	Total consumption within the district.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			BURDWAN DIVISION.			
BURDWAN.	Years. Acres. 1872-73 2,481 1873-74 2,483 1874-75 2,482 1875-76 2,481 1876-77 2,482	516 lbs. ...	Wheat is shown in *dho* and *soona* lands, or on the best lands near the rivers, or lands which have the advantage of irrigation. The quantity of seed sown per acre varies at different places, being 24 lbs. in Raneegunge, 30 lbs. in Burdwan and Bood-Bood Sub-Divisions, 36 lbs. in Jehanabad and 100 lbs. in Culna. It is sown in Kartick (October) and reaped between February and beginning of April, after the *aous* crop has been reaped, when the land is manured, watered and ploughed, and then sown with wheat. In Culna wheat and mustard are sown together.	Rs. 2 to Rs. 2-10 per md.	Not known...	Not known.
BANKOORA.	1872-73 3,000 1873-74 4,000 1874-75 4,000 1875-76 4,000 1876-77 3,900	400 lbs. ...	Wheat is cultivated on *soona* and *aousha* lands; 1st class *soona* land or clayey soil is preferred, 2nd class *soona* land or soil with an admixture of clay and sand stands next, and *aousha* land or sandy and gravelly soil last. To prepare the soil for the cultivation of wheat, the land requires thorough ploughings. During this process blue clay and cowdung are mixed with the soil as manure. Generally 50 lbs. to 60 lbs. of seed are sown in an acre. The seed is sown in the end of October and beginning of November. During the months of November, December and January the lands require to be irrigated and the earth to be turned up so as to admit moisture to the roots; rough weeding is also necessary. Wheat generally succeeds the early rice crops. In *soona* lands sugarcane and wheat are cultivated in alternate years. Wheat and mustard are generally sown together, but are reaped separately.	Rs. 2 per md.	1¾ seers per head. Wheat is not an ordinary article of food.	25,000 mds.
BEERBHOOM.	1876-77, 2,300 acres. For the four preceding years no trustworthy particulars can be obtained.	600 lbs. ...	Wheat is not grown in *muttyah* or clayey soil, but in *belya* soil, which is a mixture of sand and clay. This is a rich soil, grey in colour, light to work and not stiff. The kind of *belya* land selected is either the 1st and 2nd class *dho* land, and must be situated in close proximity to a river or stream. It follows on an *aous* rice crop, unless the ground is intended to be used for sugarcane, which is a far more profitable crop, but requires a little capital. Wheat would exhaust the ground too much for sugarcane. As soon as the *aous* crop is off the ground in November, it is manured and sown in wheat. On an average 40 lbs. of wheat are sown to the acre. It is essential to irrigate the crop at least three times. It is irrigated about the time when it appears above the ground; again late in December when the flower is in the stalk; sometimes again late in January; and always in February when the ears appear. It begins to ripen in the middle of March and is reaped in April.	Rs. 2 per md.	About 1 seer per head. Wheat is not an ordinary article of food.	12,964 mds.
MIDNAPORE.	Acres 4,000 each year.	700 lbs. ...	The kind of land preferred for the cultivation of wheat is *kala aous* or *kalamati* and *pal*. The former is high land, and the latter chur or alluvial. The land is ploughed in the latter part of September or in the early part of October. If the soil be very dry, it is irrigated, but generally the ground remains moist in those months, and scarcely any irrigation is needed at first. When the soil has been well prepared by two, three and sometimes four ploughings and by harrowing, the seed are sown in it broadcast; a mixture of other grains, such as rye, linseed, is generally sown with wheat. The quantity of pure wheat sown per acre may be calculated at an average of 54 lbs. After the seed is sown the land is ploughed and harrowed again, in order that it (the seed) may be covered with earth. The seed germinates within a week. When the plants have grown to the height of about a foot, the land is again irrigated if necessary, and then after a few days weeded; but weeding is not the general practice. When the plants shoot forth into ear, they are irrigated once more. In alluvial lands, situated on the sides of tanks, irrigation can be easily resorted to, and such lands are well suited to the growth of wheat. The crops ripen towards the latter part of February and are reaped in March. The crop which wheat follows is *aous* paddy. Wheat straw is sometimes used in thatching those parts of a roof which border the lower edges. As the straw of wheat is not eaten by cattle, the lower parts of a roof thatched with wheat straw are not injured by them.	Rs. 3 per md.	Not known, as rice is the product on which the people live.	Not known.

HOOGHLY.	Acres 300 each year.	600 lbs.	...	Wheat is grown on chur lands or on inland sandy patches, which are also fit for the cultivation of *aous* crop. The soil is clayey with an admixture of sand, and is therefore called *do-aous*. The seed is sown in Kartick or October after the reaping of *aous* harvest in August. The land is ordinarily ploughed up as much as five or six times before the seed is sown. Each acre requires from 45lbs. to 60lbs. of seed. The land is then brush-harrowed with a *moi* (a bamboo frame like a ladder), and is irrigated in Magh or January if the rainfall is deficient. Wheat flowers in the latter end of January, and the crop is reaped in the months of February and March. The cost of cultivation is about Rs. 7-8 per acre, excluding seed and rents.	Rs. 2-2 per md.	Wheat is not a staple article of food in the district.	Not known.

PRESIDENCY DIVISION.

	Years.	Acres.					
NUDDEA.	1872-73	60,000	600 lbs.	...	The Collector of Nuddea reports that the land used for the cultivation of *aous* paddy is usually preferred for wheat, especially the land on the banks of the rivers. The rice crop is reaped in August and September; and, as the waters subside, the ground is ploughed over two or three times, and the wheat is sown in October and November. The seed is sown broadcast, and the first blades appear in about a fortnight. It is weeded once when the plants are about nine inches high, and then allowed to grow till maturity. It is reaped in February and March. The crops are allowed to lie on the ground for a day or two to dry and then carried. The grain is trodden out by oxen, and winnowed by being thrown up against the wind. The straw is kept for the cattle. The quantity of seed required is about 60lbs. per acre. The land on which the wheat is grown is usually let on the *utbundee* system, *i.e.*, year by year. The land is generally cultivated for three years, and afterwards allowed to lie fallow during the same length of time, or a light crop, such as linseed, peas or mustard, is grown during one season. It is said that the value of all kinds of Indian wheat is materially affected by its admixture with inferior grain and pulses. It is not, however, the custom in Nuddea to sow pulses with the wheat, and the admixture is probably caused by carelessness in storing rather than in sowing. The ryot has no sufficient space to store his grain, so as to prevent it from being mixed with whatever else he has in possession; and in the changes of hands which take place between the field and the port, the easy-going carelessness of the natives accounts for its being fouled. The ryot takes his crop to the market, where he sells to one of the small dealers, who buy up for the merchants, who send it to Calcutta.	Rs. 2-8 per md. of 80 lbs.	Wheat is not used as an ordinary article of diet by the people, but only at festivals and ceremonial entertainments.	Not known.
	1873-74	60,000					
	1874-75	60,000					
	1875-76	58,000					
	1876-77	67,086					
MOORSHEDABAD.	1872-73	26,420	720 lbs.	...	The Collector of Moorshedabad states that a loamy or an alluvial soil is best suited for wheat cultivation. The preparation of the land generally begins in May or June, when the land is ploughed over some two or three times. During the rains the field lies fallow. Towards the end of the rains the land is again ploughed some two or three times, and the seed is sown broadcast in the months of October and November. The land is then immediately ploughed over again, and a bamboo roller, with men standing on it, is drawn over it to smooth down the surface and cover the seeds with earth. The quantity of seed sown per acre is between 90 and 100 lbs. The crop is not usually irrigated, and is harvested in March. Wheat exhausts the powers of the lands more than most other crops, and is seldom sown in the same land two years in succession. After the crop is gathered the land either remains fallow or is ploughed up for *bhadun dhan*.	Rs. 2 per md. of 80 lbs.	Wheat is not largely consumed by the people of the district. Its use is principally confined to the better class of the Mahomedan population and up-country residents. Probably 80,000 maunds would more than cover the actual consumption of the district, and this will give approximately 2½ seers for each head of population.	The quantity consumed in the district, including the seed-grain, is estimated at 1,30,000mds.
	1873-74	25,572					
	1874-75	27,460					
	1875-76	33,234					
	1876-77	39,092					

Note.—For columns (5) to (13), see pages 70 to 77.

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.	The average outturn (in pounds) per acre.	A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.	The average wholesale price of wheat.	Average consumption per head of the population of the district.	Total consumption within the district.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
RAJSHAHYE AND COOCH BEHAR DIVISION.						
RAJSHAHYE.	Years. Acres. 1872-73 500 1873-74 500 1874-75 900 1875-76 900 1876-77 1,100	The average outturn is about 800 lbs. per acre: under exceptionally favourable circumstances it sometimes reaches 1,200 lbs.	The soil best suited for the cultiivation of wheat is clay with an admixture of sand. After the paddy has been reaped, the ground is ploughed and wheat is sown in December and January. No manure is used. During the first stage of the growth of the plants the crop is weeded once. If the ground is very weedy, a second clearing is sometimes required; but, as a rule, one weeding is found to be sufficient. The crop is reaped in March or April. From 60 lbs. to 70 lbs. of wheat are required for seed per acre. The crop which wheat follows is rice.	The average wholesale price varies from Re. 1-8 to Rs. 2 per md.	Rice is the staple article of food in this district. Taking the area under wheat at 1,100 acres, and the average produce per acre at 800 lbs. (or 10 maunds), the total produce would be 11,000 maunds. Of this, it is known by the returns in the *Statistical Reporter* that 2,738 maunds, were exported last year; this leaves 8,212 maunds, to which should be added 1,236 maunds imported, giving a total of 9,448 maunds for consumption in the district, the population of which, according to the census, is 1,310,729. The average consumption per head would, therefore, be a little under 4½ chittacks. Wheat, however, is not consumed by the greater part of the population, the consumption being almost altogether confined to up-country men.	9,000 mds.
DACCA DIVISION.						
FURREEDPORE (Goalundo Sub-Division).	1,105 acres ...	720lbs. ...	The ryots prefer lands which are neither very low nor very high: the more clayey the soil the better. Wheat is usually grown here on *palan* lands and those fit for cold weather crops in general. Sowing of wheat usually succeeds the *amun* crops: the ryots begin to prepare the land for it as soon as the paddy has been reaped. The gathering of wheat commences in the latter part of April. About 10 seers seed is sown per bigha, or 60lbs. per acre.	The average wholesale price of wheat here is Rs. 2-5 per md. There is not much fluctuation of prices. Almost the whole of what the ryot has for sale is sold at once to the mahajans, who send it to Calcutta.	Except at head quarters, very little is consumed in the sub-division.	The ryots keep about one-eighth of the produce for seed, for retail sale and for their own use.
PATNA DIVISION.						
PATNA.	45,011 acres. The area given here was ascertained in 1875-76. No fresh inquiry was held in 1876-77.	800lbs. ...	Of the three kinds of wheat mentioned in column 12, the first is cultivated to a less extent than the two others, which are to be had cheaper by two or three seers in the rupee. *Kewal* (black, tenacious earth) is preferred. Wheat is sown in the month of Kartick (October and November) and reaped in Falgoon and Cheyt (February and March). The seeds germinate in about a week. A slight shower of rain at intervals is very desirable. Clouds and hail in the middle of Falgoon do greater injury than heavy showers. Seventy pounds of seed is sown per acre. Wheat follows *bhadoi* crops. Areas given in the statistical returns for the years previous to 1875-76 are not reliable, and hence omitted.	Rs. 1-13-7 per md.	A little above 1 seer.	40,131 mds.

GYA.	Special enquiries undertaken about 1872-73 gave 49,925 acres as the area under wheat cultivation,	400 lbs. ...	The land preferred is the black soil called *kewal*; next come the lighter soils, *doras* and *balsondors*. The quantity of seed sown varies from 50 to 80 lbs. per acre. The lands intended for wheat lie fallow previously. On some lands wheat is sown after some *bhadoi*, such as *morua* or maize. Sowings take place in Assin and Kartick, and the crop reaped about March.	Rs. 2 per md.	4¼ seers ...	2,18,750 mds., besides 31,250 mds. for seed.
	and the Collector believes that the cultivation has not greatly decreased or increased since.					
SHAHABAD.	306,250 acres as the average for each of the last five years.	606 lbs. per acre when a mixed crop of wheat and pulse is sown, and 640lbs. when wheat is sown by itself.	There are three kinds of land preferred for wheat cultivation—the *korael*, *bulmut* and *doosra* soils. The first is a loose black soil, very friable; and the two latter contain principally clay and sand: 80 or 90 lbs. of seed are sown per acre. Wheat does not follow any particular crop. The land for wheat is selected early in the year after the harvest of the *rabi*, and allowed to lie fallow until the rains, when ploughing commences. Reaping commences in end of February, and continues till March. Threshing and winnowing go on during March and April.	First quality about Rs. 2-0-10, inferior sort Rs. 1-13-1, per md.	9 seers ...	3,87,894 mds.
DURBHUNGA.	50,000 acres annually.	640 lbs. ...	The land prepared for the growth of wheat is *chowmas* (or that which has lain fallow a season) and the alluvial *dearahs* on the riversides: 70 lbs. of seed are generally used per acre. Wheat may be best sown when the land lies fallow for a season. The crop is sown in Kartick and is harvested in Cheyt.	Rs. 1-8-10 per md.	Not known...	Not known.
MOZUFFERPORE.	YEARS. ACRES. 1873 ... 20,000 1874 ... 6,000 1875 ... 24,000 1876 ... 24,000 1877 ... 24,000	480 lbs. ...	The *chowmas* bheet land of the best quality is preferred for wheat cultivation. Ploughing is carried on during the rainy season. In October the seed is sown; in March and April the crop is reaped. Seed is sown at 60lbs. per acre. The cost of cultivation is Rs. 8-8 per acre.	Rs. 2-3 per md.	1½ seers ...	1,00,000 mds.
SARUN.	90,000 to 100,000 acres annually.	700 to 800 lbs.	Wheat is cultivated in either lands on the banks of rivers or at a small distance therefrom. From 60 to 70 lbs. of seed are sown in one acre. Wheat does not immediately follow any crop, as the land is left fallow for the four months previous to the sowing.	Rs. 1-12-5 to Rs. 2-2-7 per md.	18½ seers ...	9,78,190 mds.
CHUMPARUN.	1,515 acres ...	896 lbs. ...	The land preferred for wheat is arable (*bargan*) alluvial land. The quantity of seed sown per acre is 128lbs. Wheat follows no crop, as the ground is left fallow previously. The season of cultivation is from Bhadro to Assin.	Rs. 1-6-5 per md.	About half a seer.	16,968 mds.

BHAGULPORE DIVISION.

MONGHYR.	165,432 acres. The area is said to be the same for each of the last five years.	1,200 lbs. ...	It is stated that the kind of soil called *kewal* is best suited for wheat. The land is ploughed three times to prepare it to receive the seed. About 2 maunds or 160 lbs. of seed go to an acre. Wheat follows the *bhadoi* crops. Wheat is sown in November. The crop remains in the ground for nearly four months, and is reaped towards the end of March.	Rs. 2 per md. of 80 lbs.	No reliable data.	No reliable data.
BHAGULPORE.	The Collector states that there are no records to show the area under wheat cultivation. All that is known is that it is increasing.	The Collector's estimate is 350 to 450 lbs.	Wheat is sown in dark loamy soil at the end of October and reaped in March, and the land is generally kept fallow for the rest of the year; 92lbs. of seed are used per acre. The ryots have no rotation of crops here, but sow wheat in their richest soil.	Rs. 1-12 to Rs. 2-4 per md. of 82 lbs.	Ditto ...	Ditto.

The figures furnished by the sub-divisional officers and by Mr. Hennessy, a zamindar and indigo-planter, are as follow:—

Maximum.

Soopool ... 1,320 lbs. Mudhopore ... 1,080 lbs. Banka ... 490 lbs. Mr. Hennessy ... 316 lbs.

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.	The average outturn (in pounds) per acre	A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.	The average wholesale price of wheat.	Average consumption per head of the population of the district.	Total consumption within the district.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
BHAGULPORE DIVISION—*contd.*						
PURNEAH.	15,000 acres. This area, the Collector thinks, represents fairly the average of the past five years. The estimate is based upon information supplied by Mr. MacQueen, Sub-Manager of Dhurumpore Estate.	Mr. MacQueen thinks the average yield is nearly 8 mds. a bigha. From inquiries made by the Collector, he thinks that it may be safely put down at 15 bushels an acre, or 900 lbs.	The Collector states that, to ensure good crop, the land should lie fallow throughout the hot weather and rains, and be repeatedly ploughed. This of course entails a large expenditure of money and labour, so it is only well-to-do ryots who can afford to cultivate this crop. This of course only refers to land not subject to inundation. Inundated land does not require the ploughing and labour which has to be expended on higher ground. The soil preferred is a mixture of clay and sand on inundated land. Wheat is sown year after year in the same field, the productiveness of which is kept from deterioration by the deposit of silt left by the river. On high lands it follows early rice, putwa (juli), or other rainy season crops. It is sown in October and reaped in March. About 60 lbs. of seed are used for an acre.	Rs. 1-10 to Rs. 1-14 per md.	Regarding the heads Nos. 6 to 11, the Collector states that he can give very little information. There is scarcely any consumption in the district, as the only people who eat flour are up-country servants. Almost all that is grown is exported. The exports are mostly made to Calcutta, as most of the wheat is grown near the Ganges. The cost of export is small. The trade is chiefly carried out by paikars, who go about the hats and collect the grain for storage in golahs till the rivers rise.	
MALDAH.	24,299 acres are said to be the average area under wheat in each of the last five years.	800 lbs. ...	Alluvial soil is generally preferred. Seed is sown in October and November, and the crop reaped in March and April. The quantity of seed sown per acre varies from 90 lbs. to 120 lbs.	Rs. 2-3-1 ...	Wheat is scarcely consumed at all in the district, the population of which principally eats rice.	
SONTHAL PERGUNNAHS (Sub-Divisions of Rajmahal, Godda and Deoghur).	The area in Deoghur is about 300 bighas. It is not known in the other sub-divisions.	2,000 lbs. per acre in Deoghur.	Wheat is grown in Deoghur on the best highland which admits of irrigation, and in Rajmahal on the higher parts of the dearahs. In Godda it is grown all over the high flat plains. In Deoghur it follows the crop called *kartic sal*, or highland rice, and is everywhere a cold weather crop. About 20 lbs. of seed are used per acre. In Godda wheat, barley and gram are constantly grown together. Wheat is often found in large quantities in the gram offered for sale.	Rs. 2 to Rs. 2-4 per md. of 80 lbs. in Deoghur.	The Deputy Commissioner states he can give no information under these two heads. The population is very mixed. Up-country men eat wheat, but they are scattered, though numerous.	
ORISSA DIVISION.						
BALASORE.	Years. Acres. 1872-73 ... 577 1873-74 ... 581 1874-75 ... 612 1875-76 ... 711 1876-77 ... 653	1,016 lbs. ...	Wheat is here grown exclusively on the banks of rivers in spots annually fertilised by silt, and the quantity of seed used is 74lbs. per acre. It follows in some cases the earliest rice crop; in others it is sown on fallow land. It is sown at the end of October and reaped at the beginning of March.	Rs. 2-6 per md.	2¾ chittacks	3,255 mds. per annum.

CHOTA NAGPORE DIVISION.

LOHARDUGGA (Palamow Sub-Division).	Not known ...	480 lbs. ...	The land chosen for wheat is of two kinds. *First* and best is the land included in the basin of the embankments or water catchments, locally called *ahars* and *bandhs*. The water from these basins is drained off after the necessity for irrigating the rice lands has ceased, and the land which during the four months of the rainy season is covered with still water receives a deposit of rich decayed matter, which acts as a manure. The soil is ploughed three times, and the wheat is sown in drills.	Rs. 7-8 per md.	Not known...	Not known.
		450 lbs. ...	*Second.*—High lands near the village on which the cattle are constantly depositing rich manure. These lands are ploughed five times, and the seed is sown generally in drills, but sometimes broadcast. The best soil is that known as *kewal*, a black spongy clay, very retentive of moisture.	Ditto ...		
		432 lbs. ...	In case of sample No. 1, the quantity of seed per acre is 55lbs.; No. 2, 45lbs.; and No. 3, 40lbs. In embanked lands wheat is always sown year after year without rotation; but in other lands wheat, if the soil is particularly good, is sown for two successive years, and after that it is followed by barley or gram or peas for two years, and then wheat is sown again. When the cultivators are of an intelligent class, the high lands are manured at the commencement of the hot season, cowdung, or more generally buffalodung, being employed, sometimes mixed with ashes and house rubbish; but the quantity used is small, hardly averaging 300 to 350 lbs. to the acre. The red wheat (*jogia*) is generally sown down in the first half of the month of Kartick, *i.e.*, between the 15th and the end of October. The other two kinds are sown a fortnight later, except in some of the more highly cultivated villages in Palamow and in the dearah lands of pargana Belounjet and Jupla on the banks of the Sone river. The wheat lands are not irrigated, the cultivators trusting to the chances of a shower of rain. During the month of January all three kinds are very liable to be attacked by smut, locally called *hurda*, the result of prolonged cloudy weather. It would appear to be liable to this disease during all stages of its growth. There was a good deal of smut this year. The samples sent have been slightly infected, the grain being partially discoloured. Gram, barley, toossoo (a small dhall), and linseed and peas are generally sown with wheat; and when a zamindar wishes to get unmixed gram, he has the ears cut off short, thus preventing the admixture of any other grain. It would be easier to get cultivators to do this than to induce them to clear their lands and to sow wheat only.	Rs. 1-5-4 per md.		
SINGBHOOM.	About 29,796 acres ascertained in August 1876. For previous years the area cannot be given.	About 720 lbs.	The cultivation of wheat is in lands known as *dadian*, or high embanked lands lying near tank or other watercourse, to allow of irrigation when necessary. It follows frequently on paddy crop, which from *badian* land is harvested in September and October, or near to the time for wheat sowing. The season for wheat cultivation in Singbhoom is from October to February, *i.e.*, the seed is sown in October and the crop is reaped in February. The quantity of seed necessary per acre is approximately stated to be 80lbs. The cost of cultivation is Rs. 10 to Rs. 12 per acre.	Rs. 2 per md.	25½ seers ...	2,68,164 mds.
MANBHOOM.	2,300 acres ...	984 lbs. ...	Crops are nearly always obtained off lands sown with wheat. The first crops consist of *aous dhan*, *gora dhan*, *moony* and *birce*, both pulse crops, and Indian-corn, and lands under sugarcane one year are frequently sown down with wheat in the following year. The cultivation commences as soon as the first crop is off the ground, generally in September, when the lands are ploughed several times and left to mellow. The land is sown in the end of October or November after another ploughing, 30 to about 60 lbs. being sown to the acre. The lands are irrigated from tanks or rivers six or seven times, and the crop ripens in March.	Ditto ...	Less than half a seer.	10,650 mds.

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment (Calcutta) by rail, by road and by river.	Local names for the varieties of wheat cultivated, and their description in English.	A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.
(1)	(8)	(9)	(10)	(11)	(12)	(13)

BURDWAN DIVISION.

BURDWAN.

Wheat was imported into the district from Calcutta, Goghatta, Teghatta, Dhoolian, Bankoora, Beerbhoom, Patna, Gya, Bhagulpore, Sahibgunge, Rajmahal, Caragola, Hazaribagh and Purulia as follows:—

	Mds.
1872-73	1,30,650
1873-74	1,30,772
1874-75	1,30,538
1875-76	1,30,797
1876-77	1,31,250

1,00,000 mds. exported to Calcutta by rail, and 17,000 mds. by river.

Sub-Division.	*From places in the interior.*	*To nearest railway station.*	*Cost for a cart-load of 20 mds.* Rs. A.
Bood-Bood	Sonamooky	Paneechur	1 4
	Ausgram	Gooskara	0 12
	Bood-Bood	Mankoor	0 10
	Hazaribagh	Raneegunge	15 0

Freight by rail to Calcutta.

	Rs.
From railway station.	Freight for 100 mds. to Howrah.
Mymaree	10
Burdwan	12
Kanoo Junction	13
Gooskara	15
Beddiah	16
Mancoor	16
Paneeghur	17
Doorgapore	18
Undal, Babasole, Mungulpore, Toposi, Raneegunge, Searsole, Neemcha, Assensole, Sectarampore	20

In addition to the above rates, Hooghly Bridge toll is charged at Re. 1 per 100 mds. for goods and grains consigned to Calcutta.

Jamali, the flour of which is reddish; *desi*, or country wheat, distinguished from those of the Upper Provinces by being of smaller grain. Other varieties are given as *gungajoli, dudha, khery and dudhia.* Most of these are described below.

The cultivation of wheat is inconsiderable in Bengal. The bulk of the wheat which comes to Calcutta for export is received from the North-Western Provinces and Behar. Cawnpore is the principal exporting mart; but in Behar also wheat is an important food staple, and there is a large surplus production. Bhagulpore and Monghyr are the principal wheat-producing districts in the Lower Provinces, and then come Nuddea, Moorshedabad and Maldah, where the lands are high and the cold weather crops are of more importance than is ordinarily the case in the Bengal districts. Calcutta takes by far the largest share of the wheat trade, and the only other considerable wheat-importing marts are Patna and Revelgunge.

It is impossible to state the total area under wheat, as in some districts no record is kept of the area under cultivation, such as Bhagulpore, Palamow in Lohardugga, and Rajmahal and Godda in the Sonthal Pergunnahs. And in many districts where wheat of an inferior quality is grown in small patches and is never exported it is not possible to give the required statistics. Such districts are Jessore, Dinagepore, Rungpore, Bogra, Pubna, Darjeeling, Jalpaiguri, Tipperah, Chittagong, Cuttack, Pooree and Hazaribagh.

Leaving the above districts out of calculation, the total estimated area under wheat would be 910,974 acres, as shown below:—

	Acres.
Bengal Proper	106,119
Patna Division	567,301
Bhagulpore Division	204,831
Balasore in Orissa	627
Chota Nagpore	32,096
Total	910,974

BANKOORA.	Annual imports cannot be ascertained, as the books and accounts of the dealers do not furnish necessary data. Roughly estimate, between 5,000 to 6,250 muunds were imported from Patna and Monghyr.	No export from the district.	.....	The charges of the East Indian Railway from Raneegunge to Howrah are Rs. 20 per 100 maunds, and the Hooghly Bridge toll charged on the same is Re. 1.	Not given.
BEERBHOOM.	Nil	4,234 mds. ...	6½ mds. are carried at the rate of two miles for a rupee to the railway stations at Cyntheea, Mullarpore, Ahmedpore and Bolepore.	For an average fare of a rupee 6½ maunds wheat is carried by rail to Calcutta.	*Gungajoli*, *khery*, *jamali*, and *dhudhi*. Description not given, but they are described elsewhere: *vide infra*.
MIDNAPORE.	About 1,00,000 mds. per annum. Almost all the wheat is imported from Calcutta.	Some wheat is exported from the Ghattal Sub-Division.	.....	.....	*Dudhia*, *jamali*, *purva* and *deshi*. *Dudhia* is whitish, soft in grain, and agreeable to the taste; *jamali* is somewhat reddish, hard in grain, and is not so agreeable to the taste as *dudhia*.
HOOGHLY.	The river traffic registration shows 11,682 mds. of wheat imported to the principal marts of the district from Monghyr or other districts of Behar and Calcutta. A part of the supply required is locally grown, and a small quantity for the same purpose is received by rail:—	Mds. 1875 ... 214 1876 ... 31 1877 ... 40 This went to Calcutta by river.	.....	Transit by boat to Calcutta, 9 pies to 1½ annas per md.	*Dudhia* and *jamali*.

	Mds.
1875	410
1876	11,682
1877	1,059

But in the absence of figures for Bhagulpore, which is the first wheat-producing district in Bengal, the above estimate cannot be accepted as correct.

The average outturn per acre for the whole of the Lower Provinces may be taken to be 771 lbs. or, leaving out the Sonthal Pergunnahs, where the cultivation is inconsiderable, while the outturn seems to be exceptionally high, the average would be 720lbs. The average outturn for the different provinces is as follows:—

	lbs.
Bengal Proper	628
Patna Division	681
Bhagulpore Division with Sonthal Pergunnahs	1,140
Ditto without Sonthal Pergunnahs	925
Orissa	1,016
Chota Nagpore	719

As the total area under cultivation cannot be ascertained, it is not possible to calculate the total outturn for the whole province from the average outturn given by the local officers. Any calculation made would be misleading.

The details of the export and import trade of wheat are given in pages 57 and 58 of the Report on the Internal Trade of Bengal, lately submitted to the Government of India. Extracts from these pages are given below:—

Exports.

Name of principal exporting district and mart.	Total of each mart.		Total of district.
	By river.	By rail and road.	Quantity.
BHAGULPORE—			
Bhagulpore ...	51,600	85,400	5,19,900
Colgong ...	16,200	56,300	
Sahibgunge ...	68,300	.....	
Ghoga ...	.....	40,800	
Sultangunge ...	.....	83,000	
Mudhoora ...	24,400	.....	
Bissonee ...	21,400	.....	
Komalakund ...	20,300	.....	
Peerpointee ...	9,500	9,400	
Balia Sahibgunge	12,100	.....	
Babhangaon ...	9,600	.....	

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment (Calcutta) by rail, by road and by river.	Local names for the varieties of wheat cultivated, and their description in English.	A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn and the details of the import and export trade.
(1)	(8)	(9)	(10)	(11)	(12)	(13)

PRESIDENCY DIVISION.

NUDDEA

Nil ...

The Collector of Nuddea states that there is no data to enable him to give the figures for five years. The following is an approximate account of the export trade at present. The district produces a little over 5,00,000 mds. It is proved from the books of the Railway Company that 2,50,380 mds. are exported by rail (this no doubt includes a small quantity from other districts sent by boat to Kooshtea), and about 2,00,000 mds. are exported by boat. The remainder includes the quantity consumed in the district and the quantity exported by road.

The district of Nuddea is divided diagonally from south-west to north-east by the Eastern Bengal Railway, of which there are 15 stations within the district, the nearest being 34 and the farthest 105 miles from Calcutta. (For rates see, Railway Tables.) From Kishnaghur, the head-quarters station, to Buggoolah, the nearest station on the line, the cost of cartage is about 1½ annas per md.

The average rate by boat from Kishnaghur to Calcutta is Rs. 7 per 100 mds. No wheat is sent by road.

Two varieties of wheat are principally cultivated in the district of Nuddea, *viz.*, *dudhia*, large, white and soft, and *jamali*, smaller, red and a little harder than *dudhia*.

MOORSHEDABAD.

In Moorshedabad the imports by boat on the Bhagiruthee are reported to have been as follows:—

	Mds.
1872-73 ...	1,899
1873-74 ...	8,936
1874-75 ...	18,980
1875-76 ...	12,592
1876-77 ...	9,109

The imports by rail are insignificant.

The exports by boat are reported to have been as follow:—

	Mds.
1872-73 ...	25,833
1873-74 ...	51,986
1874-75 ...	33,413
1875-76 ...	1,36,615
1876-77 ...	76,175

To these figures must be added the exports from Bhugwangola and from marts of the wheat-growing tracts in the south and south-east of the district, of which there are no returns. The decrease in the Bhagiruthee exports in 1876-77, as compared with the previous years, may be to some extent due to the reopening for traffic of the Bhoirub river, which has diverted much of

The East Indian Railway runs through the west of the district of Moorshedabad, and there is a branch line to Azimgunge on the Bhagiruthee in the centre of the district. The cost of a cart to carry about 14 mds. is 8 annas a day. The Collector calculates that the cost of cartage should not exceed 2 annas per md. for the carriage of wheat from the villages most distant from the line.

The Collector of Moorshedabad reports that a boat of 400 or 500 mds. can in the rains be hired to go to Calcutta for Rs. 25 or Rs. 28; a boat of 150 or 180 mds. at other seasons from Rs. 18 to Rs. 20. The charges on the East Indian

(1) *Gungajoli*, or "cream-coloured white."
(2) *Jamali* or *rangi*, or "reddish."
(3) *Kheri*, or "dwarf small."
(4) *Dudhia*, or "milky."
The last kind is little cultivated; it is a small grain, but gives a good white flour. *Gungajoli* is the best

Exports—contd.

Name of principal exporting district and mart.	Total of each mart. By river.	Total of each mart. By rail and road.	Total of district. Quantity.
Patna—			
Patna ...	1,01,300	3,09,000	4,22,800
Barrh ...	6,500	3,900	
Monghyr—			
Monghyr ...	71,100	81,000	3,77,400
Khagurriah ...	89,900	.....	
Soorujgurrah ...	40,700	.....	
Ghugree ...	31,000	.....	
Kujrah ...	.....	11,400	
Jamalpore ...	11,200	600	
Sarun—			
Revelgunge ...	3,23,600	.....	3,30,800
Nuddea—			
Hanskhal y ...	45,500	...	2,94,300
Raghoonathpore...	19,100	...	
Kooshtea ...	...	14,600	
Saintipore ...	9,200	...	
Halsa ...	...	8,700	
Bangaljhee ...	8,300	...	
Hatra ...	8,000	...	
Moorshedabad—			
Dhoolian ...	62,100	...	1,84,300
Moorshedabad ...	37,300	...	
Teakatta ...	23,700	...	
Azimgunge ...	6,200	4,000	

		the wheat traffic from the Bhagirathee. It should, however, be noted that some proportion of the exports down the Bhagirathee from Dhulian, an important mart on the Ganges, was probably not actually grown in the district. In all probability the exports from the district, principally to Calcutta by boat down the Bhagirathee, Bhoirab and Jellinghee rivers, have been nearly 2,00,000 maunds in each of the two past years. The railway has not had any large share of the traffic until this year. In 1876-77 it only carried 1,098 maunds from the district, but the wheat trade has this year taken such a start, that the Railway Company are unable to supply wagons to carry the grain delivered.	Railway for taking grain from Naihati to Howrah are Rs. 28 per 100 mds. up to 250 mds., and Rs. 21 per 100 mds. on 250 mds. and upwards. Re. 1 per 100 mds. is charged as Hooghly Bridge toll.	sort; the grains are white and large, yielding a fine soft flour. *Jamali* or *rangi* is an inferior description of wheat; the grains are small, and the flour is coarse and dirty-looking. *Kheri* is like it, but the grain is still smaller.

RAJSHAHYE AND COOCH BEHAR DIVISION.

RAJSHAHYE.	Wheat is imported from Ghazipore and other districts to a small extent. The annual import may be estimated at 1,200 mds.	In 1876-77, 2,788 mds. of wheat were exported by river to Calcutta, Goalundo and Serajgunge.	The nearest railway station is Azimgunge, distant 29 miles from the sudder station of this district; but export to *Kooshtea* is the easiest, though it is nearly 80 miles from the sudder station, as boats can go *down* stream by the Ganges all the way. The cost of a 1,000-maund boat to Kooshtea would be about Rs. 30. Cartmen charge Rs. 3 for one cart from Baulcah to Azimgunge in the dry season and Rs. 4 in the rainy season. As soon as the Northern Bengal State Railway is opened, great facilities will be afforded for the exportation of wheat by rail.	A boat of 1,000 mds. to Calcutta would cost Rs. 60.	Wheat is either *kheri* or *gungajoli*. *Kheri* is again subdivided into *jamali* and *mooski*. The best sort is called *gungajoli*.

DACCA DIVISION.

FURREEDPORE (Goalundo Sub-Division).	Wheat is not imported here.	The average annual export may be estimated at 8,750 mds.	.....	...	There are four varieties of wheat known in this sub-division, *viz.*, *patnai*, *jamali*, *gungajoli* and *kheri*. There seems to be very little cultivation here of the first two kinds, as the land is considered to be not suited to them. *Kheri* grows almost on any land, and is most largely cultivated in this part, but yields less grain than the large-berried *gungajoli*, which is a better kind, but requires pretty high lands to grow.

SONTHAL PERGUNNAHS—				
Sahebgunge	...	5,600	81,500	
Pakour	...	.....	49,400	1,71,000
Rajgowan	...	.....	16,600	
Rajmahal	...	1,300	13,500	
MALDAH—				
Maldah	...	47,100	.....	
Hyetpore	...	13,500	.....	1,08,800
Milkee	...	12,100	.....	
SHAHABAD—				
Seenaha	...	19,300	.....	
Chowsa	...	.....	15,400	83,900
Doomraon	...	.....	13,300	
Beheea	...	.....	10,200	
HOOGHLY—				
Bhuddressur	...	67,000	.....	81,000
PURNEAH—				
Caragola	...	16,500	.....	69,700
Bhowanipore	...	13,800	.....	
CALCUTTA	...	29,200	13,700	42,900
BURDWAN—				
Cutwa	...	17,100	...	38,200
Culna	...	13,900	...	
FURREEDPORE—				
Goalundo	...	500	17,600	22,900
RUNGPORE	...	.....	.....	20,000
PUBNA	...	.....	.....	16,300
DACCA	...	.....	.....	12,900
OTHER DISTRICTS...		.....	.....	2,78,600
TOTAL	...	.....	.....	75,86,700

N.B.—In the above statement only those marts exporting over 8,000 mds. in the year are specified; the total of the district will not therefore necessarily correspond with the total of the marts in each district.

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment (Calcutta) by rail, by road and by river.	Local names for the varieties of wheat cultivated, and their description in English.	A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.
(1)	(8)	(9)	(10)	(11)	(12)	(13)

PATNA DIVISION.

PATNA.

5,73,559 mds. from Jubbulpore, Fyzabad, Oudh, Goruckpore, and Shahabad. There is no data in the Collector's office to get the information for the four years.

3,82,958 mds. ...

From mart.	*To nearest railway station.*	*Cost per cart.*
Patna City	Begumpore	8 annas.
Dinapore	Khagoul	10 ,,
Behar ...	Bucktearpore	2 ,,
Barrh ...	Barrh	8 ,,

Not known ...

Dudhia—Soft and very white.
Sankhea—White.
Harha—Reddish.

Imports.

Names of principal importing district and mart.	Total of each mart. By river.	By rail and road.	Total of district. Quantity.
Calcutta ...	16,60,400	48,23,500	64,83,900
Patna—			
Patna ...	4,15,500	200	4,18,400
Sarun—			
Revelgunge ...	2,80,100	...	
Semuria ...	23,000	...	3,20,200
Seeswan ...	8,400	...	
Hooghly—			
Bhuddressur ...	53,200	...	67,100
Sonthal Pergunnahs—			
Sahebgunge ...	64,500	...	64,700
Mozufferpore—			
Lalgunge ...	19,500	...	
Hajeepore ...	15,700	...	43,800
Dacca—Bhaga ...	22,000	...	24,600
Purnea—Sherbunga ...	19,500	...	19,700
Goruckpore—Mundeea ...	14,000	...	17,700
Nuddea ...	...	...	17,100
Dinajepore—			
Bhowanigunge ...	12,000	...	14,100
Moorshedabad ...	...	...	12,000
Pubna ...	...	...	10,000
Other Marts ...	...	...	63,500
...	...	...	75,80,700

GYA.

During last year 716 mds. passed from Gya to Patna and 318 mds. *vice versâ*. There is also an import trade from Behar and Burbiga (in Patna district). From Aurungabad large importations take place, and there is also a small export from Gya to Hazaribagh.

Gya to Bankipore=60 miles, 4 annas per md.
Jehanabad to Bankipore=30 miles, 2 annas per md.
Aurungabad to Bihta station, 5 annas per md.

Ditto ...

Wheat is divided into only two kinds—*Dowadi* or light-coloured, and *lalak* or dark coloured, called also *kewalea*.

SHAHABAD.

The annual imports are from Ghazipore, Joumpore, Cawnpore and Patna.

The chief places where the exports are made are Calcutta, Ghazipore, Cachar and Howrah.

The estimated average cost of cartage to the railway stations is 3 pies per md. per mile.

Ditto ...

The wheat sown in this district are *duoodheba*. This is a superior sort, producing white, and [illegible] red wheat, and of an inferior quality.

DURBHUNGA.

Imports in 1876.

	Mds.
April ...	104
May ...	622
June ...	700
July ...	1,440
August ...	8,500
September...	1,247
October ...	5
November ...	...

Exports in 1876.

	Mds.
April ...	...
May ...	175
June ...	10
July ...	...
August ...	591
September ...	...
October ...	175
November ...	565

Not known ... ...

Ditto ...

[illegible]

MOZUFFERPORE.	1873 ... 9,000 1874 ... 14,500 1875 ... 1,00,000 1876 ... 1,10,000 1877 ... 1,25,000 Average 1,12,000 Wheat is imported from Khagoria and Malia (in Monghyr), Phoelkia and Sooktia (in Bhagulpore), Segowlee, Mcherpore and Nanore (in Chumparun) by the river Gunduck.	Wheat is not exported from this district; only 1,000 mds. were exported this year to Calcutta owing to the facility by rail.	From town to railway station is Re. 1 per 100 mds.	Produce not being sufficient for export, the information cannot be given.	I. *Jamalkhani* II. *Dudhia*, (milk white). III. *Laldesi* (country red). IV. *Hurra* (hard).
SARUN.	The average produce is 8,90,625 mds. This renders a slight importation necessary.	Sarun does not export wheat.	Rs. A. P. From *Chupra* cartage of 100 maunds to Doorigunge at 10 annas per cart carrying 16 mds. ... 3 12 0 Boat-hire from Doorigunge to Begumpore Ghat ... ... 3 0 0 Cooly hire from the ghat to the station ... 2 0 0 Total ... 8 12 0 From *Revelgunge* boat-hire of 100 mds. to Begumpore Ghat ... 4 0 0 Coolie-hire ... ... 2 0 0 Total ... 6 0 0	See preceding column.	*Dudhia* (soft white), *lalli* (hard red), *jamali* (reddish and white).
CHUMPARUN.	*Nil* ...	*Nil* ...	Not known	Not known ...	*Hodda* and *jamalkhani*, *i.e.*, reddish and white.

Almost the whole of the wheat consignments are sent to Calcutta for export to Europe. The registered imports into Calcutta amount roundly to 6½ lakhs of mds. or 4,800,000 cwts.; the exports amount to 5½ lakhs or 4,000,000 cwt.; the difference, amounting to 1½ lakhs of mds., is the quantity that was locally consumed in Calcutta during the year.

Patna imported 4 lakhs of mds., and Revelgunge 2¾ lakhs of mds., derived in both cases mostly from Oudh and the district of Goruckpore. The whole of the Revelgunge imported supply, as well as 50,000 mds., the produce of the Sarun district itself, was re-exported to Calcutta. The Patna imports were almost all re-exported to Calcutta.

BHAGULPORE DIVISION.

MONGHYR.	Wheat is not imported into this district. It grows enough wheat for home consumption and exportation; 12,509 mds. were imported from Delhi during the famine of 1873-74.	Wheat is exported to Calcutta. The following figures will show the proportion sent by railway and boat:— By rail. Mds. / By river. Mds. 1872-73 ... .. 2,100 / 5,906 1873-74 ... ... / 5,732 1874-75 ... ... 3,112 / 8,364 1875-76 ... ... 2,256 / 8,994 1876-77 ... ... 21,223 / 21,934	Half an anna per md. ...	6 annas per md. by rail and 2 annas per md. by boat.	(1) *Awal dudhia.* (2) *Doem dudhia.* (3) *Bajra.* (4) *Jamali.*

Statement showing the cultivation of, and trade in, wheat in Bengal.

Names of districts in which wheat is grown.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment (Calcutta) by rail, by road, and by river.	Local names for the varieties of wheat cultivated, and their description in English.	A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.
(1)	(8)	(9)	(10)	(11)	(12)	(13)
BHAGULPORE DIVISION—*contd.*						
BHAGULPORE.	No wheat as a rule imported into the district. Some was brought down in 1873-74 from Cawnpore and Delhi during the famine of 1873-74.	Two-thirds of the exports from villages north of the river Ganges to Calcutta are said to go by boat, but the actual quantity exported annually by the river is not given. The following exports were made to Calcutta during the year 1876 and from January to June 1877 by railway:— Ghoga ... 45,573 / 10,553 Peerpointee ... 11,128 / 5,796 Sultangunge ... 35,015 / 2,771 91,716 / 19,120 The Collector has not been able to get the information regarding the exports at the other two railway stations, *viz.*, Bhagulpore and Colgong, in his district.	It is said that the average country cart carries 12 mds., travels 12 to 15 miles, and earns about 6 annas a day.	Boat-hire to Calcutta is from Rs. 30 to Rs. 25 per 100 mds. generally; but this year the Collector states it has increased to Rs. 50.	Three varieties of wheat are grown in this district, *viz.*,— (1) *Dhudia.* (2) *Sonateekar.* (3) *Jamali.*	
PURNEAH.	Regarding the heads Nos. 6 to 11, the Collector states that he can give very little information. There is scarcely any consumption in the district, as the only people who eat flour are up-country servants. Almost all that is grown is exported. The exports are mostly made to Calcutta, as most of the wheat is grown near the Ganges. The cost of export is small. The trade is chiefly carried out by paikars, who go about the hâts and collect the grain for storage in goluhs till the rivers rise.				There are three varieties of wheat grown in this district— (1) *Dudhia.* (2) *Hadda.* (3) *Jamali.*	
MALDAH.	The average import into the district for five years is estimated to be 64,682 mds., and the places whence imported are Moorshedabad and North-Western Provinces.	The annual exports for the same period have been estimated to be 2,88,107 mds., and the places to which exports are made are Calcutta, Dacca, Dinagepore, Moorshedabad, Kooshtea, Sahebgunge, Dhulian, Cutwa, Jungypore, Shomsergunge, Bhogwangola, &c. The export trade is carried on chiefly by river. Only from Kaliachuck and Sahebgunge police stations about 1,000 mds. are exported by road, and 500 mds. by rails from Kaliachuck only.	4 annas per md.	4 annas a md. by river. The cost by rail is not known.	The varieties of wheat cultivated in this district are— *Gungajoli.* *Jamali.* *Kheri.* *Dudhia.* *Makdi or khudi.* *Harra or makdi.*	

SONTHAL PERGUNNAHS (Sub-Divisions of Rajmahal, Godda and Deoghur).	Into the whole district of the Sonthal Pergunnahs from Monghyr, Bhagulpore and Purneah. It has been estimated that the whole yearly import into Deoghur is about 9,800 mds., and that during the season about 2,800 mds. are offered for sale each day in Sahebgunge, and about 560 mds. a day in Rajmahal. The total imports into the district are not given.	Export almost exclusively from Sahebgunge and Rajmahal. Details are not given. The export is said to be almost by river.	Not known	Not know ...	The varieties of wheat are *jamali* and *gungajoli*. The name equivalent to wheat all over the district is *gohu* or *gohú*.	

ORISSA DIVISION.

BALASORE.	312 mds. from Calcutta and 1,430 mds. from Cuttack.	Mds. 1872-73 ... 2,418 1873-74 ... 2,213 1874-75 ... 2,855 1875-76 ... 3,611 1876-77 ... 2,250 To Calcutta and Midnapore. Of the above quantity, about 200 mds. are sent annually by sea and the rest by land.	9 annas per md.	3 annas and 6 pies per md.	*Gobra and desi*, both small in grain.	

CHOTA NAGPORE DIVISION.

LOHARDUGGA, (Palamow Sub-Division).	Not known ...	Not known ...	13 annas and 9 pies per md. ...	Not known ...	1. Chumpapuri, sometimes called *bhorila* or *mondila*, a fine white beardless wheat, supposed to have been imported originally from Bhojpore. 2. *Daudih* or *daudia*, a bearded wheat, not so white in colour as No. 1, supposed to have come originally from the Central Provinces. 3. *Jogia*, a red bearded wheat, the most common of all.	
SING-BHOOM.	*Nil* ...	*Nil* ...	Rs. 12. One cart carries about 8 mds.	Not ascertainable.	*Lalkagohum, oojlahgohum.*	
MAN-BHOOM.	About 5,125 mds. from Lohardugga, Hazaribagh and Patna.	About 3,780 mds. to Ranegunge and Bankoora.	4 annas per md. of 82 lbs. from Purulia to Ranegunge.	...	The only wheat grown in the district is known by the name of *chunia*, and it appears to be a hard, red, small-berried wheat.	

No. 3747-177, dated Nagpur, the 28th September 1877.

From—J. W. CHISHOLM, Esq., Officiating Secretary to the Chief Commissioner, Central Provinces,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am desired by the Chief Commissioner to acknowledge the receipt of Resolution in the Department of Revenue, Agriculture and Commerce, No. 1-45, dated 14th March 1877, on the subject of wheat cultivation and exportation. This Resolution itself notices what steps have been recently taken in these Provinces towards improving the cultivation of wheat; and there is nothing now to add on that head, except that a few bags of English wheat have been since received from Messrs. Sterns, Hobart of Bombay, and have been distributed among Deputy Commissioners in wheat-growing districts to be experimented with in the coming season. Two bags of this quantity have also been sent to the Nagpur Model Farm, where the experiments will be very carefully conducted, and the general result—which will not be known until March or April next—will be separately reported on, or noticed in the Revenue Report of next year, as may seem desirable. The very successful experiments at the Model Farm last year in the cultivation of Indian wheat have already been reported to your office in the papers covered by my letter No. 2987-140, dated 31st July last, and they will be referred to further on in connection with the acreage outturn under ordinary cultivation in these Provinces, on which subject there is naturally some difference of opinion.

2. As requested in paragraph 5 of the Resolution, I am now to forward a memorandum bringing together all the facts procurable regarding wheat cultivation and trade in the several districts of this Province, and to offer the following general remarks on each of the 13 headings into which the subject has been divided :—

(1) *The names of the districts in which wheat is grown.*

3. The district of Sambalpur, in the extreme east of the Province, is the only one where the cultivation of wheat is almost unknown. The same might be said of the Upper Godavari district, in the extreme south, bordering on the Madras Presidency; but the Deputy Commissioner has given the small acreage cultivated, and this has been entered in the returns. Both these districts are known as rice-growing tracts, and depend almost entirely for their food-supplies on the autumn or "kharif" crops, of which rice is the principal one.

(2) *The area (in acres) under wheat in each of the last five years to the end of* 1876-77.

4. This is given for each district in the memorandum; and for the Province the totals are—

For	1872-73 ...	... 3,488,769 acres.
„	1873-74 ...	... 3,597,804 „
„	1874-75 ...	... 3,502,831 „
„	1875-76 ...	... 3,496,139 „
„	1876-77 ...	... 3,493,374 „

The cultivation in the Feudatory States is not included. A few of these States are in the very heart of British territory, but most of them are on the eastern confines of the Province. A few of them again are large wheat-producing tracts; but no agricultural statistics regarding them are obtainable. In some districts where the practice prevails a portion of the area given is sown with a mixed crop of wheat and chenna (*cicer arietinum*). This practice is alluded to in the fourth paragraph of the Resolution as not unknown in other parts of India; and its ill-effects on the quality of the wheat exported have been fully made known to the people. But it is a practice of long standing, and will probably be only discontinued gradually, as the demands and prices for *quality* in the foreign markets become more generally known and appreciated. It is said, however, that a mixed crop of wheat and gram is sown only where the produce is intended for home consumption and not for export; and it is true that the practice is mostly followed in the northern districts of the Province, where wheat forms a main item in the dietary of the people, the flour of wheat being mixed with the flour of gram to make cakes or gruel. In Narsinghpur it is said, "where gram is sown with the wheat, the proportion of seed is 2 of wheat to 1 of gram, the produce being intended for home consumption." If this is a fair general representation, the adulteration of exported wheat with gram and other grains is not attributable to the growers to the extent supposed; and this view is somewhat supported by the tolerably clean supplies which are brought to market direct by the farmers. There are in such supplies all the impurities of the threshing floor in the shape of chaff and earthy particles, due to the primitive system of treading out the grain by cattle in the open field, and to defective winnowing; but prominent evidence of adulteration is not common at this stage. It is when the produce changes hands and is found in the store-rooms of the dealer that more or less admixture becomes a regular feature in the samples; and, whether from design or accident, it is now that not only are grains of the cheaper pulses found in the wheat, but wheats of the different kinds are all mixed together; so much so that an *ekdana* specimen, *i.e.*, wheat of a single species unmixed, is hardly to be had in the markets, except where it has been specifically contracted for in advance, at higher prices. The remedy, then, would appear to be largely in the hands of the Trade. If English houses will take mixed grain and pay varying prices for varying degrees of admixture, the custom of admixture will become established and flourish indefinitely. Some of the English houses at Bombay have set up at Nagpur and elsewhere cleaning and winnowing machines, whereby supplies are sent direct to the ship-board in a condition answering all the requirements of foreign markets. Small, however, as these initial efforts are compared with the total exterior trade in wheat, they indicate the direction in which improvement is to be looked for; and it is to be hoped that native dealers will follow the example.

Regarding other variations of increases and decreases under this heading, some are readily explainable—as, for instance, the apparent decrease in Seoni, an important wheat-growing district, which is caused not by any falling off in the cultivation, but by transfer of territory to

Balaghat. On the other hand, the decreases in Saugor and Nagpur, both large wheat-growing districts, are not so easy to account for; for here, as elsewhere, the high demand for export has probably led to some extension of the cultivation. There is always some uncertainty attaching to these agricultural statistics, furnished as they are by the malguzars (village proprietors), the great body of whom are illiterate men, and who employ the cheapest clerical agency on the spot to prepare the annual "patwaris' returns." Of late years, more attention has been paid to the preparation of these returns; and though they are still difficult of prompt collection and defective in point of accuracy, they are, on the whole, more approximate than they were, so that the large falling off in the two districts mentioned, and smaller deficiencies in others, are more apparent than real. In other districts there is a gradual and sensible increase, which is consistent only with the recent history of the trade in wheat. The total area under wheat in the Province as above given represents 24 per cent. of the total cultivation of all kinds. The proportion is the same in the Punjab, where wheat occupies twice the area given to any other single crop; whereas in these Provinces wheat occupies a somewhat subordinate position to rice. In the United Kingdom, according to the Parliamentary Returns for 1876, the proportion for wheat was 19 per cent. on total cultivation, the largest area being given to oats.

(3) *The average outturn (in lbs.) per acre.*

5. The memorandum under this head discloses some difference of opinion among district officers. It is no doubt difficult to fix upon an average outturn for a whole district, the proportion of first class land compared with second and third class soils on which wheat is raised varying in each district. For the whole Province perhaps an average of 10⅔ bushels or 640lbs. might be taken. In the Punjab, on poorer soils, the average outturn taken is 14⅓ bushels. On the Model Farm at Nagpur experiments with wheat on various soils, manured and unmanured, with and without irrigation, yielded—

212 lbs. per acre,	920 lbs. per acre,
444 „ „	1,600 „ „
600 „ „	2,200 „ „

the first four outturns representing pretty nearly what is obtained by ordinary native cultivation, the last two what is probably never obtained by the native methods. These two relatively high outturns show, however, what can be got by high farming in India without costly artificial manures; but irrigation and manuring on the system of the Model Farm is not within the means of the ordinary cultivator, and deep and frequent ploughing is rather the exception than the rule.

(4) *A brief account of the cultivation.*

6. This subject will be treated under five heads :—

(*a*) *The kind of land preferred.*

The black cotton soil, called by various names in different districts, and classified according to the degree of admixture with sand or gravel,

is what is generally preferred for wheat. It is fully described tin the accompanying memorandum under this head, in an extract from Mr. Elliott's Settlement Report of the Hoshangabad district. Its fertility under continuous cropping is wonderful : a fallow being seldom allowed, and rotation with green crops an exceptional treatment. In the wheat districts it is very carefully kept in good tilth by frequent ploughings during the breaks in the latter rains, and seldom receives more than a slight dressing of dry farmyard manure at this time. It is, like all clay soils, very retentive of the moisture it receives during the rains, and it seldom fails to carry the crop through to maturity, even in unfavourable dry winters.

(*b*) *The quantity of seed sown per acre.*

7. The memorandum shows considerable difference in practice under this head in the different districts, the quantity per acre ranging from 150lbs. in some to 50lbs. in others. It is true that a markedly high outturn of wheat was obtained on the Model Farm last year from a sowing of only 40lbs. per acre; but that was in the best fields and under irrigation. Irrigation is so exceptional in ordinary field cultivation in these Provinces, that practically it may be said to be non-existent; and being so, 50lbs. or even 55lbs. per acre must be considered very thin sowing, where a bushel per acre in England is considered a safe minimum, and just enough to admit free tillering, which in this country is not a very prominent feature in wheat cultivation. On the other hand, it would be hazardous to say that the maximum of 150lbs. is wasteful sowing, seeing that much of the land employed is poor, and the failure of a sufficiency of moisture when the crop is approaching maturity is not an infrequent contingency in the forecast. Generally perhaps it may be said that something below the mean, or say from 80 lbs. to a bushel and a half per acre, is about the average of seed sown per acre—there would be more and less in different places, and of course that standard would be supported by the dictum of ancient usage as proper to local conditions. This is not to be wondered at perhaps if we consider that even in advanced countries, where long-established agricultural usage has been disturbed by the teachings of science, the question is one that still provokes occasional discussion, and there are as stout advocates of thick as there are of thin sowings. In the Punjab the average given is 83$\frac{1}{16}$ lbs. (1 maund 1 seer and 11 chittacks) per acre.

(*c*) *The crop which wheat follows.*

8. As already remarked, rotation, as understood in European countries, is practically unknown. In some districts wheat is said to follow pulses *in the same year*—those pulses which can be cropped off the land by the close of the rains in October; but such double-cropping is very limited. In other places wheat follows jowar (*Holcus sorgham*) or cotton or oil-seeds in the next year, or it follows rice in the *same* year where the fields are embanked and flooded during the monsoons. This can hardly be called rotation, if it is not very culpable rotation to raise two cereal

crops on the same field in the same year; for a more galloping system of exhaustion of plant-constituents in the soil can hardly be conceived, even allowing for all the virtues of the black cotton soil. It is not common however; and, as a general rule, it may be said that wheat is cultivated on the same field year after year until signs of exhaustion compel a fallow or complete rest for one or even two years.

(d) The season of cultivation, and other useful particulars.

9. The general practice is to cultivate the field reserved for wheat during the breaks in the rains in September and up to the middle of October, when the seed is drilled into the land. Broadcast sowing with wheat is nowhere practised; hoeing and weeding go on as the crop progresses and breaks admit of them; and about February or March the crop is cut. A dry or wet season accelerates or retards the ripening of the crop; but harvest time is usually a little later in the hill districts than it is in the plains: irrigation would also protract the ripening of the crop. Threshing and winnowing would then go on in the dry season, through March and April; and the stock is brought to market from that time till the beginning of the rains, in June, when communication with the interior is stopped, except in places where there are metalled roads and the streams all bridged.

At almost all large towns there are places called "ganjes," where corn is bought and sold; and here in the season every morning may be seen crowds of carts from the country laden with grain and seeds, and a busy concourse in contention over prices. Three places in particular have attained some celebrity as central corn marts,—Dongargarh in the Raipur district, Tumsar in the Bhandara district, and Seoni in the Hoshangabad district: the last is on the Great Indian Peninsula Railway, in the Nerbudda valley, and in that respect has considerable advantages over the other two, which are 116 and 53 miles respectively away from the railway terminus at Nagpur. Seoni-Hoshangabad is the chief corn mart for the Nerbudda valley and Bhopal trans-Nerbudda; and here the white pisi wheat is obtainable in large quantities, the supplies from Bhopal being considered very superior. The next best quality of wheat—a short white specimen called "bot" or "botka"—is obtainable in the first two mentioned marts in large quantity. Nagpur itself is the head-quarters of the trade in white pisi of the Seoni district. This Seoni is some 80 miles north of Nagpur, and is connected with it by a fine metalled and bridged road, whereby communication is carried on uninterruptedly throughout the year. The pisi raised in this district is equal to that obtained at Seoni-Hoshangabad, and is very largely bought for exportation to Europe: its cultivation is said to have extended rapidly since the foreign demand for it arose within the last few years.

(5) The average wholesale price of wheat.

10. These are given in the memorandum for the different districts, and may be accepted as a general indication of current prices at the places of production. These prices are a little above the average of past years, owing to the extraordinary demands from the famine districts of

Madras and the steady continuance of demand for foreign export. The former may be expected to cease in a few months, and then prices may go back a little. For trade purposes the prices ruling at centres like Nagpur and Hoshangabad, where large wholesale business is mostly transacted, are of first importance. The prices are for uncleaned produce; and allowing a small percentage for loss in cleaning and freight to Bombay, it can always be calculated whether such prices admit of a profitable trade with England at any time, as prices in England go up or down.

(6) *Average consumption per annum per head of population.*

11. This is a difficult question; but most district officers have attempted to answer it. Such answers are, however, the roughest of estimates, as there are whole classes that never eat wheat, others who use it only occasionally, and few that take it as a regular daily meal.

(7) *Total consumption within the district.*

12. The answer to this question is a corollary of the above, and, such as it is, depends on the correctness with which the non-eating and partially wheat-eating classes have been estimated. For the Province the consumption has been set down at 14,128,365 maunds. It is an approximate estimate only, and amounts to about half the total outturn.

(8) *Annual imports into the districts for five years, and places whence imported.*

13. In the memorandum each district has given what is imported into it from neighbouring districts and from districts outside the Province where it is a frontier district. A provincial total of all such imports would have no meaning, or might be misunderstood as implying the extent to which the Province imported wheat for its consumption; whereas it merely represents the *local* movement of the trade. This is probably not what it is sought to know; and presuming that it is intended to ascertain under this heading what the Province imports of wheat from *other* Provinces, either in displacement of its own exports or as consignments passing through it, I am to give the following, extracted from the trade returns of the five years:—

	1872-73. Mds.	1873-74. Mds.	1874-75. Mds.	1875-76. Mds.	1876-77. Mds.
From the North-Western Provinces ...	25,266	40,117	19,583	33,098	15,192
From Central India ...	26,103	1,338	181	54	31,032
From Berar and Khandesh	6,562	9,307	17,914	41,357	35,479
From Eastern Coast districts	34	17	492	1,040	...
Total ...	57,965	50,779	38,170	75,549	81,703

Except the small imports from the eastward, of which there were none in the year 1876-77, the bulk of these imports were towards the railway, intended for re-exportation.

(9) *Annual exports for five years, places whither exported, and proportion carried by road, river or rail.*

14. In the same way the memorandum under this head gives the *local* movement of the trade, and a provincial total would be misleading. I am accordingly to give below the provincial exports of wheat and the places to which sent, by road, rail and river separately noted:—

	1872-73. Mds.	1873-74. Mds.	1874-75. Mds.	1875-76. Mds.	1876-77. Mds.
By road—					
To Central India	8,846	18,120	34,596	38,822	29,366
To Eastern Coast	50,897	22,911	26,474	65,409	15,647
By river (Mahanadi)—					
To Eastern Coast	...	...	...	...	9,702*
By rail—					
To the N. W. Provinces ...	2,76,425	6,04,501	5,10,212	1,19,417	39,546
To Bombay ...	6,64,511	10,09,840	4,49,356	1,723,153	27,60,649
Total ...	10,00,679	16,55,372	10,20,538	19,46,801	28,54,910

The largest exports are towards Bombay, intended for the English and Continental markets; and as this goes by rail, it probably receives little injury in the transit. Much of it is no doubt godowned at Bombay before it changes hands and is taken on boardship. In the hands of native dealers some injury may occur in this way from damp, &c. The increase in 1876-77 is remarkable, being nearly double that in any preceding year, having reached to nearly 3 million maunds, or above half a million quarters of wheat. Some portion of this, made up principally of the inferior hard red wheats, has gone to the famine districts of Bombay and Madras; but the railway returns do not indicate how much went this way.

(10) *Estimated average cost of cartage to the railway station nearest the district.*

15. These are given for each district in the memorandum, and call for no comment.

(11) *Cost of transit to port of shipment.*

16. There is no road traffic to port of shipment from any district The cost of boat or river traffic from Bilaspur to Cuttack down the Mahanadi is given under heading (10). The cost or means of transport from Cuttack to False Point, the nearest port of shipment, may probably be noted in the Bengal returns. No wheat goes down the Godavari river to Coconada, the nearest port in that direction. Thus all the trade to Bombay and Calcutta, the two nearest ports, goes by rail; and the rates per maund are given in the memorandum under this head for those districts from which consignments are made in either direction.

* The last is the only year in which the river traffic has been given separately.

(12) *Local names for the varieties of wheat cultivated, and their description in English.*

17. These are given in the memorandum for each district, and are there fully described. Samples of each kind, properly labelled, have already been sent to your office, and will be readily identified with the descriptions given in the memorandum. For foreign export, the pisi,

(1) Pisi white.

a soft white full-bodied grain, is preferred, and commands the highest price. It is recognised as bearing favourable comparison with English wheat, and grain for grain is about the same weight; or rather a small trial weighment with some English wheat received from Messrs. Sterns, Hobart of Bombay gave 18 grains of pisi as equal to 20 grains of English wheat, but the former was fresh, and the latter of the previous season's growth. Some of this quality of wheat (pisi), raised on the Model Farm last year under favourable conditions as to irrigation and manure, was described by the Bombay firm above named as the best they had ever seen in India, and was valued at 12*s.* 3*d.* per cental. This seed has been distributed among Deputy Commissioners of the principal wheat-growing districts, with instructions to extend its cultivation among agriculturists as much as possible. Should the foreign demand for pisi wheat continue, there is no doubt the cultivation of it will extend very considerably, as it does enter much into local consumption, the hard red wheats being preferred. Up to within the last year or two the price of pisi was always below those for the red kinds; and it is only now that it has taken the first place in the market consequent on the active demand for it for exportation.

(2) Pisi red.

There is a red variety of this wheat, soft, white inside, of the same size and weight—in short, differing from the white variety only in the colour of the cuticle; it is slightly cheaper.

(3) Botka white ("little club").

Botka is a distinct variety, being a short, stout grain; heavy, white and soft like the pisi. It is readily taken for foreign export, and is always a little cheaper than the white pisi. It is in some districts also called mundi pisi and bhokria.

(4) Botka red.

This is only a red variety of the botka, and commands a lower price.

(5) Bansi.

This appears, and is of course locally recognised as, a distinct variety, being of a yellowish colour, rather long, hard and presenting a glassy fracture when broken. It is not much taken for export to Europe, but is preferred to all other kinds by the natives, and is said to make the best bread. It was always the dearest wheat in the local market before the great demand for pisi for export arose. In some districts it is known as houra, daudkhani and julalia.

(6) Kathia.

This is a large red coarse grain, very much like bansi in every respect but the colour. It is the most cultivated, and, being the cheapest of all wheats, is most largely consumed. Very little is taken for foreign

export, except to the Continental markets. In some districts it is called ghatka, hansia, bangasia and chawalkathi.

The above of course is only a commercial, not a botanical, description of the wheats of this Province. Practically, they may be divided into two classes—the two *soft* kinds, red and white, and the *hard* kind, red and white.

(13) *A general summary for the Province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.*

18. This heading has been partly anticipated in the foregoing remarks. To recapitulate briefly, however, it may said that the total area under wheat in the Province was in the past year 3,493,374 acres, not including the cultivation in the Feudatory States and some of the large non-feudatory zamindaries, for which no statistics are available. Where there is so much difference of opinion as to an average outturn per acre in any single district, it is not easy to strike a fair average outturn for the Province. The cultivator, generally for official information, states the outturn as five-fold—*i.e.*, to one maund of seed (80lbs.) he reaps five maunds (400lbs.). It is believed to be more than this, particularly in the best wheat-growing districts; and, unless it was so, it would not be the paying crop it is known to be. A native cultivator will not readily acknowledge a large yield: to do so might bring him misfortune. In fact, his superstition is so strong, that he will not usually weigh his produce for his own private information. It has been shown in the entries under head "4 (*a*)" that an experienced settlement officer in Hoshangabad obtained a return of eight-fold from a field said to be the most exhausted (rasid) in the village; and eight-fold is by another settlement officer said to be the outturn over all the districts in the Nagpur plain; but he puts the quantity of seed sown at 50lbs. per acre, and so makes the outturn 400lbs. The experiments on the Model Farm already referred to might here be quoted in detail:—

Wheat.

Acres.	Seed sown per acre.	Outturn.		Return.
8-0	33 lbs.	5,600 lbs.	=	21 fold.
5-3	33 „	2,260 „	=	13 „
10-3	40 „	10,120 „	=	23½ „
2-0	33 „	1,200 „	=	19 „

The two larger outturns need not perhaps be noticed, as being obtained under conditions not available to the general farmer; but the thirteen and nineteen fold returns, which the Superintendent looked upon as partial failures, would seem to indicate that the ordinary district outturn is something more than is admitted. To adhere, however, to the general opinion held at the last settlement, it will be necessary to take 80lbs. as the average for the Province of seed sown per acre, to take eight-fold as the average return, and thus make the total outturn of wheat for the Province 27,946,992 maunds. Accepting this,

then, as an approximate estimate of the aggregate outturn of an ordinary season, there has to be deducted from it the reserve of seed for the next sowing at 80lbs. per acre 3,493,374 maunds, and the estimated local consumption 14,128,365 maunds, which would leave for export 10,325,253 maunds; but it is well known that the practice is to retain in stock very large reserves in the districts, every well-to-do farmer having his "piu," or underground granary, which he will open only when a bad season and high prices offer inducement, or when lapse of time gives warning of longer retention being injurious. Though primitive, the plan of burying grain in dry wells so effectually as to defy damp and weevil is well understood; though at times there is considerable loss and waste. Thus a large quantity is annually withheld from foreign exportation, and is consumed locally in seasons of scarcity. It is necessary to mention this to account for the great disparity between the exportable surplus of the annual outturn and the quantity annually exported. The increasing foreign demand and the facility offered by the railways for exportation have much diminished this disparity of late years; but it is still great, and will continue so until a railway shall connect the terminus at Nagpur with the eastern districts of Chhattisgarh, where it is commonly believed that large stores are held in reserve from the absence of adequate means of transport. The exportable quantity having been stated above as near as it is possible to estimate it, the actual exports in the year 1876-77 were 2,854,910 maunds, which would leave a surplus in the country of 7,470,343 maunds, or about a quarter of the aggregate outturn.

At first sight this might appear an unnecessarily high surplus, and one that, with a run of four or five good seasons, would make wheat a drug in the market, and bring ruin to the agriculturist; but, carefully examined, there would seem to be little room for these fears, for these 7 million maunds, it will be remembered, is only a six-months' consumption for the wheat-eating population alone; and if we may suppose a failure of the wheat crop in the year after the one which yielded this surplus, it would become necessary to reserve out of this surplus another 3¼ million maunds for seed; and the actual available surplus in the second year would be only equal to a three-months' consumption of the wheat-eating population. Between these two extremes, of a run of four or five good seasons and maximum produce and a total failure of the crop in a single year, there would be a graduated series of medium results, *i.e.*, partial failures of the wheat, or failures of the rice and millet crops, making gaps to be filled by the wheat surplus—all which considered, 7 million maunds may not perhaps be held to be an improbable surplus in a year of full returns. The popular belief in these matters is, that there is always a reserve in the country sufficient for two years' consumption, taking of course all food-grains into consideration; and if the analogy may be applied to wheat, and to those parts of the country where wheat is the main article of food, it would, according to the above calculations, require the accumulated surplus of four or five good seasons to make up such a reserve.

Whatever may be the truth as regards the surplus of an ordinary good season, it seems clear that the Province can afford to export about 3 million maunds of wheat (above half a million quarters) annually, under existing conditions of cultivation, without encroaching much on its food reserves.

Memorandum regarding wheat cultivation and trade in the Central Provinces.

(1) *Name of district in which wheat is grown.*	(2) *Area (in acres) under wheat in each of the last five years, viz.,*				
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.
Nagpur	321,441	290,598	298,137	287,374	288,637
Bhandara	86,987	71,192	65,912	78,192	65,931
Chanda	62,708	47,948	47,036	57,752	53,799
Wardha	160,014	158,358	158,742	192,636	192,636
Balaghat	5,253	13,490	12,687	13,299	14,904
Jubbulpore	323,804	323,045	341,515	343,849	345,000
Saugor	478,830	494,403	480,600	449,501	441,002
Damoh	186,812	189,512	195,857	188,966	204,650
Seoni	281,206	272,842	271,915	262,584	261,042
Mandla	62,111	61,658	60,433	78,930	79,602
Hoshangabad ...	583,053	619,687	586,435	560,476	566,988
Narsinghpur ...	290,000	290,000	313,000	296,000	286,000
Nimar	11,173	9,979	10,290	12,300	17,163
Betul	194,118	194,118	194,118	194,118	194,118
Chhindwara	147,918	203,768	141,201	142,569	140,988
Raipur	260,557	261,461	264,915	263,950	266,837
Bilaspur	32,607	95,582	59,874	73,356	73,906
Sambalpur	No wheat	grown in	this district.		
Upper Godavari ...	177	163	164	287	171
TOTAL ...	3,488,769	3,597,804	3,502,831	3,496,139	3,493,374

(3) *The average outturn (in lbs.) per acre.*

	lbs.		lbs.
Nagpur	400	Hoshangabad	400
Bhandara	400	Narsinghpur	480
Chanda	492	Nimar	400
Wardha	400	Betul	250
Balaghat	320	Chhindwara	400
Jubbulpore	700	Raipur	480
Saugor	438	Bilaspur	360
Damoh	440	Sambalpur	...
Seoni	440	Upper Godavari	559
Mandla	740		

(4) *A brief account of the cultivation, in which should be stated—*
(1) *the kind of land preferred;*
(2) *the quantity of seed sown per acre;*
(3) *the crop which wheat follows;*
(4) *the season of cultivation; and*
(5) *other useful particulars.*

Nagpur ...	(1) Black soil and second class soil "murand." (2) 80 lbs. (3) No rotation in the same year. The field may either lie fallow in one year, or sown with early autumn (rain) crops one year and the next year sown with wheat. (4) Wheat is sown in October, and the crop ripens about the middle of February. (5) The Deputy Commissioner has the following remarks. The wheat cultivation in this district will never improve until the ryots can till deeper, manure, irrigate, and separate the different kinds of wheat while the crop is being harvested, and make selection of seed. Deeper tillage, manuring and irrigation are no doubt beyond their power just now; but the keeping apart of distinct varieties of wheat is easy enough. The distinction is easily seen from the ears; and if, when the harvesting is done, enough of each kind is separated off to sow 2 or 3 acres the next season, it would not be long before enough is obtained to sow large areas. Then the selection of seed is much neglected. A certain portion of a crop which outwardly appears stronger than the rest is generally retained for seed. But as often as not this portion does not hold better ears than the rejected portion. Ryots should be made to understand that food-producing crops can only be increased in outturn by selecting the largest ears. This is practised by the ryot, always preserving the largest "bhutas" of jowar. Similarly with wheat, the largest ears picked out all over a field, and the practice continued yearly, will establish a better food-producing plant.
Bhandara ...	(1) Murand, known as black cotton soil. (2) 80 lbs. per acre. (3) No rotation practised. (4) Ploughings in September, and continued till sowings in October; harvest February or March. (5) Bhandara is more a rice-growing district; and the cultivation of wheat is carried on in a few localities where alone the soil is suitable.
Chanda ...	(1) Kali or black soil of the first and second class; (2) murand. (2) 82 lbs. per acre.

(4)—*continued.*

Chanda—(*continued*).	(3) Wheat follows jowar (*Holcus vulgare*) and cotton, but is generally sown alone in the same field year after year. (4) Fields prepared in September during breaks; and sowing begins in October, and continue to middle of November, the drill being used. The crop ripens in February.
Wardha ...	(1) Black alluvial soil. (2) 50 to 55 lbs. per acre. (3) Follows jowar, til, linseed, cotton and tur. (4) Sowings in October; harvest in February. (5) The fields are ploughed and harrowed during the breaks in the rains from July to September, when the seed is drilled in.
Balaghat ...	(1) Black soil; also an inferior kind known as murand. (2) 75 lbs. (3) No rotation. (4) Sowings at end of rains in October. (5) The district is mostly a rice-growing country.
Jubbulpore ...	(1) Kabar and mund; is in point of fact the black cotton soil, so well known in the Nagpur country and the Berars (see description for Hoshangabad). (2) 70 to 100 lbs. per acre, according to soil. (3) Follows rice in the same year on rich lands. On poorer lands after a fallow gram is sown; the next year a mixed crop of gram and wheat, or gram and wheat in alternate years. The recent demand for pisi for export had led in places to wheat being sown by itself, but it will take time for the practice to become general. (4) In embanked lands the bunds are repaired just before the rains, and, after being ploughed, are allowed to fill and so remain till the middle of October or earlier, when the bunds are cut; and after two or three days wheat is sown with the drill plough without any previous ploughing. The field is "bakared" or harrowed about the middle or latter part of October. In unembanked lands the sowings are about this time made after a shower of rain. (5) *Vide* description for Hoshangabad.
Saugor ...	(1) Mur, kabar and mund lands preferred. (2) 100 lbs. (3) In mur land wheat is sown year after year, and on the other two kinds it follows cotton and pulse crops every second year. (4) Sowings in October, November; reaping in March, April; threshing and winnowing not completed till May.

(4)—*continued.*

Saugor—(*continued*).	(5) As a rule, no manure is used, and wheat is sown on the same land year after year. Only where irrigation is within reach near tanks it is sown after pulse crops have been reaped in the same year.
Damoh ...	(1) Black loam (kabar), a lighter brown soil, murand or mund, also a third class soil, separ. (2) 110 lbs. (3) Wheat is sown year after year till the land, from incessant use and owing to imperfect cultivation, yields comparatively very little, when, perhaps after 12 or 14 years, a fallow is allowed of three or four years. (4) Sowings in October and November after repeated ploughings during breaks in the rains; harvest in March. (5) The kabar lands yield the finest crop, next to that the murand, and after that the separ. This latter kind of soil yields but poor crops, if not bunded or embanked to retain water during the rains: by careful bunding and flooding it yields a double crop—first rice, and then wheat. Some of the darker deeper soils in the same way, when well bunded, yield double crops. In the greater part of the wheat lands there is but little rotation of crops. In cases where there is a double crop the ploughing is done immediately after the cutting of the first crop of rice; but the greater part of the lands are kept entirely for wheat, and are prepared for months before the sowing. The great enemy to wheat is the prairie grass, the roots of which spread themselves in a regular network below all the better soils. If these are not carefully harrowed down throughout the rains, they force themselves to the surface, and impede the germination of the seed and the growth of the corn. The system of embanking and flooding the field seems to keep the grass down, even without ploughing; and when the time for sowing comes, the water is let out, and the moist land is easily ploughed, while a finer crop is secured.
Seoni ...	(1) Kabar, first and second class. (2) 120 lbs. per acre. (3) No rotation; after the crop has been cut the land lies fallow till the next year's crop is sown. (4) Rains last till end of September, and the land is repeatedly ploughed and cleared of weeds during the breaks. Seed is sown in October. The harvest is in February and March.
Mandla ...	(1) Kabar first class, and mund. (2) 150 lbs.

(4)—*continued.*

Mandla—(*continued*).	(3) Follows rice in the same year. (4) Sown in October and harvested in March, April. (5) No manure is used. The soil on which wheat is raised is always rich. No artificial irrigation is practised. The yield is seldom above ten-fold.
Hoshangabad	(1) Black cotton soil, which, from its richness and its capacity for retaining moisture, is probably unsurpassed by any soil as a producer of wheat. And the following extract from the Hoshangabad Settlement Report, 1865, by Mr. C. A. Elliot, C.S., gives an excellent account of its nature :— "*Para.* 53.—The soil that prevails throughout the district is the black alluvial loam, commonly known as 'black cotton soil.' It has all the well known characteristics that distinguish this soil wherever it is met with,—the uncommon fertility, the tendency to crack and sink into fissures and holes, which makes it very dangerous for riding, the great powers of absorption, the extreme muddiness and softness in rainy weather, and the retentiveness of moisture. It is of varying depths, from 6 inches to 30 feet, and its average depth is probably 10 feet: beneath it is found red gravelly clay, or sand. The general name for it all over the district is 'mur' or 'murrior,' but in Rajwara it is usually called 'kohar,' elsewhere 'kabar'; is considered a more clayey variety of 'mur,' quicker to dry, and after to fissure, mostly found in low bottoms. It is a stronger soil than average 'mur,' if it gets water enough; but it dries so rapidly that, unless a shower of rain falls during the ploughing, it is as hard as a stone before sowing can be begun. The true 'mur' should be perfectly flat and level, free from stone or sand; the water running off it by gently sloping channels without denuding the land. From its richness, its depth, and its capacity for retaining moisture, the 'mur' is probably unsurpassed by any soil in India as a producer of wheat; but in this so-called 'cotton soil,' cotton or any other kharif crop could not grow. When unlimited heat and moisture are supplied, it becomes so rank in its luxuriance, that it is absolutely too rich to grow any useful crop: the plant grows up unhealthy, and is choked by the mass of weeds around it. These in ordinary seasons it is impossible to clear away; for, if hand-hoeing is used, the labourer's feet sink in, and the hoe brings up the sown plant along with the weeds; or, if the 'kolpa' is used, the bullock's feet sink in. When a break in the rains occurs, and the land gets dry, or 'batur'

(4)—*continued.*

Hoshangabad —(*contd.*)

as it is called, it can be weeded; but the breaks are rare, and in rich soil the weeds would extirpate the plant before the hoe got its chance. A good system of sub-soil draining might do something to remedy this; but at present the result is that 'mur' and 'kohar' lands are devoted entirely to rabi: the lighter lands produce the kharif crops. There is a debatable class of land called 'morin,' in which either class of crop can be sown, and there rotation can be followed; but, for all practical purposes at present, black soil level land and land growing rabi crops are convertible terms, while undulating light and kharif lands convey one and the same idea."

Mr. Elliot had three samples of black soil examined and analysed by Mr. D. Waldie of the Barnagore Chemical Works near Calcutta. The following are the results, with extracts from Mr. Waldie's report:—

"Each sample was subjected to a mechanical analysis, by thoroughly softening the soil with boiling water and elutriating. This was done by subjecting the softened earth, placed in a tall deep glass, to a current of water through a pipe issuing from an orifice of about a sixteenth of an inch in diameter near the bottom of the glass (the column of water in the pipe being about fifteen inches high) till all the finer portions were washed off, the residue being coarse sand. The finer portions, being allowed to settle, were again subjected to a gentle current of water, or rather a rapid dropping through the same tube, till all the finest particles were washed off. The residue was fine sand. The finest particles settled were the clay. Each portion was dried at 212°, weighed, burnt, and weighed again; and the following were the results:—

"*No. I.*—Black soil from Pachlaora, Pargana Rajwara. Loss by drying at 212°, 6·8 per cent. moisture.

	Incombustible earth.	Matter expelled by ignition.
Coarse sand and gravel ...	4·50	·04
Fine sand ...	18·92	1·68
Clay, or finest particles ...	68·10	6·76
	91·52	8·48
Loss by ignition ...	8·48	
Soil dried at 212° ...	100·	

(4)—*continued.*

Hoshangabad —(*contd.*)

"*No. II.*—Black soil from Rehsulpore.
Loss by drying at 212°, 5·7 per cent. moisture.

	Incombustible earth.	Matter expelled by ignition.
Coarse sand and gravel ...	10·32	·44
Fine sand ...	23·34	1·41
Clay, or finest particles ...	59·02	5·47
	92·68	7·32
Loss by burning ...	7·32	
Soil dried at 212° ...	100·	

"*No. III.*—Black soil from Cheewal.
Loss by drying at 212°, 7 per cent. moisture.

	Incombustible matter.	Matter expelled by ignition.
Coarse sand and gravel ...	4·03	·41
Fine sand ...	28·14	3·41
Clay, or finest particles ...	55·57	8·44
	87·74	12·26
Loss by burning ...	12·26	
Soil dried at 212° ...	100·	

"

(2) 80 lbs. per acre, varying according to season; less being sown in a moist season than in a dry one, and more being sown in light undulating than in rich flat soils.

(3) Wheat generally follows gram and cotton.

Extract from Mr. Elliot's Settlement Report.

"The large crops, kharif and rabi, as a rule are neither manured nor irrigated. Opium, tobacco, pân, rice, sugarcane, melons, and all the small market garden

(4)—*continued.*

Hoshangabad —(*contd.*)	crops which kachies sow, are manured, and all, except rice, tobacco and melons, are irrigated. But they are considered as a kind of fancy agriculture; and the true cultivator, the kirsan, looks on them with contempt as little peddling matters, and what stirs his ambition is a fine large wheat field (gohulie) 80 or 100 acres in extent, as flat as a billiard board and as black as a Gond. I have already said that the rabi and kharif lands are separated by a broadly-defined mark, so that the simple system of alternating the two sets of crops, which is current in Upper India, is impossible here. The kharif crops are always sown on a system of rotation; but not the rabi. Year after year for thirty or forty years the same field will be sown with wheat; and probably this is the only soil in the world which could bear such a strain on it, without manure, rotation or fallow. When the land begins to be exhausted, gram will be sown on it, and then wheat again for a year or two, and then it will be let lie fallow. Formerly when the uncultivated land was large in extent, the practice of throwing a field into fallow and breaking up another in its stead was more common than it is now; but this practice is still pursued with second class sorts. "The local word for a field being exhausted is 'ruseed,' and in old reports and returns this is a phrase of constant recurrence. There are great numbers of villages against which in the second and third five years' settlement books the remark is written: 'soil good, but quite exhausted'; 'soil thoroughly worn out.' Yet these same villages and these identical fields have gone on being cultivated from that day to this, with only such fallows as could be allowed by breaking up uncultivated land in place of the field thrown out of cultivation—a resource which has been diminishing every day. "The old rate of produce in the golden age, or fifty years ago, is supposed to have been ten-fold; and judging from the Tapti valley, which is in the same condition now, I do not conceive it can have been more than twelve-fold. I reckon the average now to be six-fold; and my belief is that it fell very rapidly from twelve-fold to about eight, and then rather slowly to six or seven; that it was at that stage when the land was reported 'very much exhausted' in 1830, and that it has fallen very slightly, if at all, since then. Manure is of course the natural remedy for exhaustion. The village of Kalamry, near Hoshangabad, was recorded as one

(4)—*continued.*

Hoshangabad —(*concld.*)	of the most 'exhausted' villages in the district thirty years ago. I enquired for and took the most exhausted field in the village, and manured and cultivated it two years running. "The first year (1864), I raised a crop of four maunds of gram and one-and-a-half of barley. The gram was a good crop, eight-fold then; but the barley was a failure, and wanted water. "The second year (1865), which was not on the whole a favourable season, the crop was eight maunds of wheat, or eight-fold; there was only one field in the village equal to it, and that had been taken up from fallow the year before. "The opinion which I formed from observation and enquiry as to the exhaustion of the soil is supported by Mr. Waldie's analysis and report. He says :— " 'The soil consists of trap rock in the process of disintegration, and the two columns of soluble and insoluble in acid show the progress of decomposition of the rock. The chief peculiarity of the soil will be the constancy and regularity of its supply of mineral constituents to vegetation, from the gradual decomposition of the rock by the carbonic acid and oxygen of the atmosphere, with water, and the changes of temperature.' "
Narsinghpur	(1) Black soil, named kabar. (2) 120 lbs. (3) Wheat is sown on same land continuously, following pulses in some years. (4) Latter part of October or beginning of November after close of the rains. (5) Wheat is the principal staple product of this district. The land is ploughed during the breaks of the rainy months, or the field is embanked so as to submerge it and so prevent the growth of grass or weeds during the monsoons. The seed is sown by the common drill attached to the plough. When gram is sown with the wheat, the proportion of seed is two of wheat to one of gram, the produce being intended for home consumption, not for export. Weeding of the standing crop is seldom necessary. The crop is not irrigated, the soil being very retentive of moisture. The application of manure is very exceptional. The crop is harvested in March, and the threshing effected by cattle being driven over it,—walking round a wooden post to which they are tied. The winnowing is a primitive process. On windy days a man stands on some high place, and,

(4)—*continued.*

	taking a basketful, commences pouring the contents down, when the chaff is blown away.
Nimar ...	(1) Gohalee, a black mould, tenacious of moisture and not requiring irrigation. "Gutta" and "mul" soils require irrigation and yield less. (2) 70 to 80 lbs. in dry cultivation, and 50 to 75 lbs. in irrigated lands. (3) In lands which yield two crops, wheat follows urud and other pulses, which are sown and reaped by the close of the rains, when the land is sown with wheat. (4) Sowing completed by middle of November. (5) Manure is applied either in the shape of droppings of cattle or the refuse of hemp is ploughed into the soil.
Betul ...	(1) Kali or black soil, and on less superior land called "khardi." (2) 82 lbs. (3) No regular rotation followed. Wheat sometimes sown with gram. (4) October or November, immediately after the close of the rains; harvest in February and March. (5) Manuring little practised, and where attempted, the sweepings of the village constitute the manure.
Chhindwara...	(1) Black cotton soil, first and second class, and murand. (2) 80 lbs. per acre. (3) As a rule, wheat follows wheat without any change; occasionally sugarcane takes a rotation. (4) After ploughing in May the soil is left exposed to the atmosphere throughout the rains. The seed is sown in October and November, early or late according to season; the crop ripens and is cut and brought to the threshing floors in March and April. The corn is thrown then in heaps, and no attempt at staking to preserve it from damp is made. It is then trod out by bullocks and winnowed on windy days with a stool and fanscoop.
Raipur ...	(1) Black cotton soil of the first and second class, called respectively kunhar and dorsa. (2) 80 to 100 lbs. per acre. (3) Sometimes follows linseed and kodo. (4) Sowings in October and November. (5) The land is ploughed and prepared twice during breaks in the rainy season, to free it from weeds; and again before sowing in October some lands are embanked, to preserve moisture and increase the yield.
Bilaspur ...	(1) Same as Raipur.

(4)—*concluded.*

Bilaspur —(*continued*).	(2) 64 lbs. per acre. (3) Wheat sometimes follows rice, where the latter crop may have failed. (4) Sowings in October, November. (5) Same as Raipur.
Sambalpur ...	No wheat grown in this district.
Upper Godavari.	(1) Black soil. (2) 160 lbs. (3) Follows jowar or gram. (4) Sowing in November; harvest in February and March. (5) Wheat is little sown in the district; supplies being imported from Raipur.

(5) *The average wholesale price of wheat.*

Nagpur ...	34 to 48 lbs. per rupee, according to quality.
Bhandara ...	55 lbs. per rupee.
Chanda ...	43 lbs. per rupee.
Wardha ...	45 lbs. per rupee.
Balaghat ...	80 lbs. per rupee.
Jubbulpore...	50 to 60 lbs. rupee.
Saugor ...	60 lbs. per rupee.
Damoh ...	50 lbs. per rupee.
Seoni ...	55 lbs. per rupee.
Mandla ...	82 lbs. per rupee.
Hoshangabad	30 to 32 lbs.
Narsinghpur	41 lbs. per rupee.
Nimar ...	30 lbs. per rupee of 1st class wheat and 36 lbs. 2nd class.
Betul ...	39 lbs. per rupee.
Chhindwara	40 lbs. per rupee.
Raipur ...	106 lbs. per rupee.
Bilaspur ...	160 lbs. per rupee.
Sambalpur ...	*Nil.*
Upper Godavari.	32½ lbs. per rupee.

(6) *Average consumption per annum per head of population.*

Nagpur ...	260 lbs.
Bhandara ...	52 to 60 lbs. per head per annum.
Chanda ...	136 lbs. per head per annum.
Wardha ...	32 lbs. per head per annum.
Balaghat ...	41 lbs. per head per annum.
Jubbulpore...	220 lbs. to 360 lbs. per head per annum.
Saugor, ...	.....
Damoh ...	188 lbs.; a mere estimate.
Seoni ...	228 lbs., calculated on total population, portion of whom eat no wheat.

(6)—*continued.*

Mandla ...	Not ascertainable.
Hoshangabad	365 lbs. per head per annum.
Narsinghpur	The population numbers 339,395 souls, of whom some are aborigines who do not eat wheat; and the remainder who eat wheat use also occasionally jowari, bajra and other grains. It is calculated that about 11,00,000 maunds of wheat are consumed in the district, and on the wheat-eating population the average daily consumption is taken at ¾ seer for an adult and ⅜ seer for children. The wheat produce of the district is estimated at 15,52,270 maunds.
Nimar ...	140 lbs., calculated on total population, portion of whom eat no wheat.
Betul ...	140 lbs., calculated on total population, portion of whom eat no wheat.
Chhindwara	120 lbs. per head per annum.
Raipur ...	36 lbs. per head of population.
Bilaspur ...	24 lbs. per head of population.
Sambalpur ...	None.
Upper Godavari.	The people live on rice, jowar, &c.,—wheat being in demand only at the sadr station, and for the establishments on the Godavari river works. Any calculation of consumption per head of population would, therefore, prove fallacious.

(7) *Total consumption within the district.*

Nagpur ...	20,00,000 maunds.
Bhandara ...	3,75,623 „
Chanda ...	3,54,450 „
Wardha ...	1,35,000 „
Balaghat ...	12,936 „
Jubbulpore ...	15,00,000 „
Saugor ...	16,47,910 „
Damoh ...	6,20,176 „
Seoni ...	12,62,305 „
Mandla ...	5,90,497 „
Hoshangabad	15,00,000 „
Narsinghpur	11,00,000 „
Nimar ...	3,30,000 „
Betul ...	4,75,230 „
Chhindwara	4,80,000 „
Raipur ...	13,00,000 „
Bilaspur ...	4,29,238 „
Sambalpur ...	None.
Upper Godavari.	15,000 maunds, mostly of imported grain.
TOTAL ...	1,41,28,365

(8) *Annual imports into the district for five years ending* 1876-77 *in mds. of* 82 *lbs.*

	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	And places whence imported.
Nagpur ...	10,40,000	13,75,000	9,00,000	7,50,000	7,50,000	This estimate is exclusive of supplies passing through the district: imports are from Raipur and Seoni.
Bhandara ...	...	...	...	...	...	
Chanda ...	97,811	26,427	16,056	24,893	32,737	From Berar and Nizam's country.
Wardha ...	638	659	585	554	500	From Berar and Nizam's country.
Balaghat ...	22,000	22,000	22,000	22,000	22,000	From Raipur district.
Jubbulpore ...	4,07,697	3,51,772	4,18,887	5,04,098	5,01,827	From Damoh, Bilaspur, Seoni and neighbouring districts, but quantities from each unknown.
Saugor ...	3,26,575	4,57,109	3,25,680	3,65,690	2,50,620	From Bhopal State and adjoining Narsinghpur district.
Damoh ...	...	...	...	...	...	
Seoni ...	...	...	...	...	...	
Mandla ...	No imports: through trade to Jubbulpore from Chhattisgarh.					
Hoshangabad ...	24,329	1,088	181	53	74,757	From Malwa.
Narsinghpur ...	20,000	18,000	28,000	20,000	40,000	Saugor district.
Nimar ...	3,46,000	3,36,900	3,43,100	3,48,700	3,75,300	North-Western Provinces, Nerbudda valley districts in the Central Provinces, Berar and Holkar's territory.
Betul ...	...	...	...	...	...	
Chhindwara ...	...	...	...	...	...	
Raipur ...	...	...	...	...	...	
Bilaspur ...	...	...	...	...	...	
Sambalpur ...	Unknown	...	...	...	...	
Upper Godavari ...	600	600	600	600	600	Raipur district.

(9) *Annual exports for five years ending* 1876-77 *in mds. of* 82 *lbs.*

	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Places whither exported.	Proportion carried by Rail.	Road.	River.
Nagpur ...	1,16,567	46,333	72,791	1,64,643	...	Berar & Bombay	Whole	...	...
Bhandara ...	27,153	29,749	19,387	17,240	24,542	Nagpur ...	...	Whole	...
Chanda ...	14,884	4,226	3,684	3,126	1,881	...		...	...
Wardha ...	...	...	...	...	1,70,817	Bombay ...	1,70,617	...	...
						Berar ...	...	200	...
Balaghat ...	600	600	600	600	600	Kamptee ...	...	Whole	...
Jubbulpore ...	1,47,477	1,42,897	6,80,861	5,65,984	7,59,595	Bombay ...	11,73,068	...	...
						Calcutta ...	11,23,146	...	...
Saugor ...	1,50,352	1,35,892	1,15,955	72,275	3,75,282	Bundelkhund ...	...	Whole	...
						The whole of the exports in 1876-77 went to the Railway in Narsinghpur for the Madras famine districts.			
Damoh ...	Large export, but unknown in quantity, as it passes through Jubbulpore.								
Seoni ...	1,26,253	1,35,608	1,14,085	1'81,929	...	Nagpur and Jubbulpore.	...	Whole	...
Mandla ...	5,19,520	5,19,520	5,19,520	5,19,520	5,19,520	Jubbulpore.	...	Whole	...
Hoshangabad...	...	...	89,377	5,46,003	1,51,418	Bombay and famine districts.	Whole	...	...
Narsinghpur ...	25,000	20,000	30,000	60,000	1,00,000	Bombay ...	Whole	...	...
Nimar ...	65,000	63,500	62,500	63,000	86,000	Bombay and Malwa.	75,000	21,000	...
Betul ...	1,45,000	1,45,000	1,45,000	1,45,000	1,45,000	Berar ...	...	Whole	...
Chhindwara ...	6,500	6,500	6,500	6,500	6,500	Seoni ...	...	Whole	...
						Nagpur ...	...		
						Omraoti ...	...		
Raipur ...	4,23,000	4,23,633	6,88,322	6,87,134	5,02,835	Nagpur ...	...	4,54,835	...
						Jubbulpore ...	...	22,000	...
						Cuttack ...	...	...	26,000
Bilaspur ...	1,80,000	1,80,000	1,80,000	1,80,000	1,80,000	Jubbulpore ...	...	1,74,500	...
						Mirzapur ...	...	1,000	...
						Cuttack ...	...	...	4,500
Sambalpur ...	...	...	...	...	...	...	...	...	...
Upper Godavari	...	...	...	...	...	...	...	...	...

(10) *Estimated average cost of cartage to the railway station nearest to district.*

Nagpur	There are three railway stations in the district, to which the cost of carriage from different parts of the district would vary.
Bhandara ...	2 to 3 annas per maund to Nagpur, the nearest railway station.
Chanda ...	2 annas 5 pies to Warora, nearest railway station, but not yet opened for general traffic.
Wardha ...	4 annas 6 pies to Hinganghat, nearest open railway station.
	½ to 1 anna per maund.
Balaghat ...	No direct communication with railway station.
Jubbulpore ...	4 annas per maund to nearest railway station as a general average, there being several railway stations in the district.
Saugor ...	5 annas 2 pies per maund to Kareli railway station; and 6 annas 5 pies to Gadarwara.
Damoh ...	6 annas per maund to Jubbulpore, the nearest railway station.
Seoni ...	To Nagpur railway terminus 8 annas per maund; to Jubbulpur 5¾ annas per maund.
Mandla ...	9 annas per maund to Jubbulpore, the nearest railway station.
Hoshangabad	1½ annas per maund to nearest station.
Narsinghpur.	There are several railway stations on the line running through this district.
Nimar ...	There are several railway stations in this district, and the cost of cartage is estimated at from 3 to 6 pies per maund per mile.
Betul ...	8 annas per maund.
Chhindwara	10 annas per maund to Nagpur, nearest railway station.
Raipur ...	8 annas to 1 rupee per maund, according to the part of the district from which sent, to Nagpur, the nearest railway station.
	For cost of transport by boat, see Bilaspur.
Bilaspur ...	Rs. 1¼ per maund to Jubbulpore railway station (and Re. 1 per maund to Nagpur, but very little goes this way).
	Boat hire to Cuttack by the Mahanadi is, for a boat of
	400 maunds burden Rs. 75
	200 „ „ 60
	100 „ „ 30
	25 „ „ 12
	10 „ „ 8
Sambalpur	No direct communication with railway stations.
Upper Godavari.	No communication with railway station.

(11) *Cost of transit to port of shipment per maund of 82 lbs.*

	By rail.	By road.	By river.
Nagpur ...	Re. 0-9-8 per maund to port of shipment.		
Bhandara ...	No direct trade with Bombay.		
Chanda ...	Re. 0-10-0 per maund to Bombay.		
Wardha ...	Re. 0-9-8.		
Balaghat ...	No direct communication with port of shipment.		
Jubbulpore...	Re. 0-12-8 per maund to Bombay.		
Saugor ...	Kareli railway station to Bombay=554 miles, on 100 maunds Rs. 63-7-8; to Calcutta, 846 miles, on 100 maunds Rs. 96-15.		
Damoh ...	No direct trade with Bombay or Calcutta.		
Seoni ...	No direct communication with port of shipment.		
Mandla ...	No direct trade with port of shipment.		
Hoshangabad	11 annas per maund.		
Narsinghpur	Re. 0-9-11 to Re. 0-10-5, according to station from which sent.		
Nimar ...	.....	.....	
Betul ...	No direct communication or trade with seaport.		
Chhindwara	No direct trade with port of shipment.		
Raipur ...	No direct trade with seaports.		
Bilaspur ...	No direct trade with seaports.		
Sambalpur ...	.....	.....	
Upper Godavari.	No export of wheat.		

(12) *Local names for the varieties of wheat cultivated, and their description in English.*

Nagpur ...	(1) Haura, a large round, yellow hard wheat. (2) Botka, a small white or yellow wheat. (3) Chawalkathi, a mixed variety of ill-shaped grain of various colours.
Bhandara ...	(1) Pisi. (2) Bansi, next in quality to haura. (3) Haura, considered the best. (4) Kathia.
Chanda ...	(1) Kathia, (2) kathia lal (red), (3) mal kathia, (4) bansi, and (5) mal hawali.
Wardha ...	(1) Haura, a large firm white wheat, not largely grown. (2) Sonsala, a yellowish grain. (3) Bhokra, an inferior wheat. (4) Kathia } red coarse grains. (5) Lal pisi }
Balaghat ...	(1) Bansi, a yellow wheat, locally preferred. (2) Pisi, a white wheat. (3) Kathia, a red wheat.

(12)—*continued.*

Jubbulpore ...	(1) Jalalia, the finest, but rare; a large white wheat, ripens early. (2) Pisi, a full white wheat, bearded. (3) Mandi pisi, a small white wheat, common; beardless variety. (4) Kathia, most common, reddish brown wheat; esteemed by natives.
Saugor ...	(1) Kathia, brownish red, short, plump, hard grain. (2) Pisi, small white, soft grain. (3) Hansia, large coarse grain, slightly brown and hard. (4) Jalalia, slightly smaller than hansia and same colour. There appears to be other varieties hardly recognisable from the above; and indeed, as a rule, all red wheats are known as kathia and the white as pisi.
Damoh ...	(1) Kathia, most liked, reddish and hard. (2) Jalalia, white brown. (3) Hansia, white brown, but inferior. (4) Durra, large light coloured grain. (5) Pisi, white, cultivated for export.
Seoni ...	(1) Mandi pisi, a soft, white wheat, with a slightly red tinge. (2) Kathia, a red wheat; locally considered the best. (3) Pisi, a soft, white wheat, rather small; much in demand for foreign export. (4) Bangasia, a black bearded wheat; much liked by the natives. (5) Jalalia, a superior wheat of a fine white colour, rare.
Mandla ...	(1) Kathia, a red wheat. (2) Jalalia, white with a red blush. (3) Bangasia, pale red, a full-grained wheat. (4) Mandi pisi, a white wheat, smaller than kathia, and heavy. (5) Red pisi. (6) Pisi sookrawala, *i.e.*, bearded. (7) Jalalia, second kind.
Hoshangabad	(1) Jalalia, a large whitish wheat, and the finest in quality. (2) Kathia, a first class red wheat, hard, very little inferior in weight to jalalia, and grows better than it, in second class soil. Jalalia ripens a few days earlier than kathia. (3) Soharia is a white wheat, small, but of fine quality; but it is not extensively sown. (4) Pisi, a soft white wheat. (5) Pisi red, soft, red wheat.
Narsinghpur	(1) Pisi, (2) kathia: the former is a full, white soft wheat, much in request for foreign export; the latter is

(12)—*concluded.*

	harder and a little brown, preferred by the natives to the former as sweeter.
Nimar ...	(1) Bansi, first class wheat, partly yellow and partly reddish: (2) dhanya or dand khani, and (3) kathia chowdharia; both inferior kinds of red colour.
Betul ...	(1) Ekdana, the best kind of white unmixed wheat. (2) Pisi, white soft wheat. (3) Khamra (not described). (4) Kathia, a hard red wheat.
Chhindwara	(1) Pisi, a well known white wheat. (2) Bhokria, a variety between white and red. (3) Kathia, a red wheat.
Raipur ...	(1) Pisi white, the best. (2) Pisi red. (3) Kathia.
Bilaspur ...	Same as Raipur.
Sambalpur ...	None.
Upper Godavari.	Kathia, an inferior kind of hard red wheat.

No. 36B., dated Hyderabad, the 23rd March 1878.

From—A. J. DUNLOP, Esq., Offg. Secy. for Berar to the Resident, Hyderabad,

To—The Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce.

I am directed by the Resident to submit herewith, for the information of the Government of India, the accompanying reports on wheat cultivation in the Hyderabad Assigned Districts which have been prepared in accordance with the instructions conveyed in Resolution No. 1—50, dated 14th March 1877, samples of Berar grown wheat were forwarded to your office in December last, as advised in my letter No. 28B., dated the 5th of that month.

The Commissioner's memorandum appended to these reports leaves little room for remark on this subject by the Resident. The cultivation of wheat in Berar is comparatively limited. It at present occupies only 8·39 per cent. of the total cultivated area of the Province; but, in response to a better demand, the area sown with it has increased in the past few years, and may reasonably be expected to do so still more. Should any unforeseen causes ever militate against the extensive cultivation of cotton as now carried on, wheat would no doubt in a great measure take its place.

The admixture of wheat with inferior grain such as barley and gram, referred to at paragraph 4 of the Resolution, is not practised in Berar. The grain is cultivated quite by itself, and its quality is generally considered very fair.

1	2					3
Name of the district in which wheat is grown.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.					The average outturn (in pounds) per acre.
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	
1. Amraoti	140,052	90,350	121,701	120,310	129,879	221½ Mds. 3,59,602*
2 Akola	51,711	82,250	57,168	69,659	54,444	240 Mds. 1,63,332*
3. Ellichpur	74,776	45,759	44,076	42,164	41,696	206 Mds. 1,07,367*
4. Buldana	124,105	132,311	137,934	132,473	146,166	275 Mds. 5,02,446*
5. Bassim	80,072	98,979	110,244	101,471	101,705	260 Mds. 3,30,541*
6. Wun	24,700	14,850	16,898	35,050	63,940	260¾ Mds. 2,08,404*
	495,416	464,499	488,021	501,127	537,830	244

* Total outturn in maunds during 1876-77.

1	4	5	6	7
Name of the district in which wheat is grown.	A brief account of the cultivation, *viz.*, the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, &c.	Average wholesale price of wheat.	Average consumption per head of the population of district.	Total consumption within the district.
			lbs.	lbs.
1. Amraoti	For the sowing of wheat, a first class black soil is preferred. The quantity of seed sown per acre ranges from 32 to 40 lbs. The crop which wheat follows is either linseed or gram. Wheat is sown during the month of October.	Ranges from Rs. 3-1-6 to Rs. 1-12-6 per md.	123	841,306
2. Akola	The cultivators of wheat prefer the black soil where it is deep and shows no undulations, which would cause too great a drainage. The Kunbi never weighs the amount of seed he deposits in the earth: 24 lbs. per acre may be taken as the nearest approach to the correct quantity. The land is generally prepared between the commencement of the monsoon and August. It is frequently weeded. The sowing takes place in the month of November. The great aim of the Kunbi is to so prepare the black soil that it will not crack.	Ranges from Rs. 3-3-3 to Rs. 2-2-6 per md.	60	391,923
3. Elichpur	During the rains the ground is ploughed and prepared for cultivation. In the month of October the sowing is carried out by means of a *tophan* or sowing machine drawn by three pairs of bullocks. In each acre from 30 to 40 lbs. of seed are sown in soil of the first sort. Wheat is also sown in second sort of soil, but not with such good results.	About Rs. 2-5-8 per md.	57	79,241
4. Buldana	Wheat is sown during the month of October in rich black soil that does not crack when dry. From 46 to 50 lbs. of seed are sown in an acre of soil which the cultivators prepare in April and harrow once a fortnight till October in order to clear off all roots, &c. In rich black soil wheat follows some crops, but in light soils the yield is inferior if it follows any crops.	At present Rs. 3-12 per md., but in time of plentiful harvest Rs. 1-10-8.	40	202,567
5. Bassim	First quality of land preferred. The quantity of seed sown per acre is 96 lbs. Rotation of crops is not much observed in this district. If the soil is of first quality, wheat is sown for a succession of years in the same field.	Rs. 2-8 per md.	62	233,495
6. Wun	The soil, which is preferred for the cultivation of wheat generally, is what is commonly called the black soil. The quantity of seed sown per acre varies from 24 to 32 lbs. In rotation wheat follows cotton the first year and jowari in the second. Wheat is sown generally in the month of October. The ground to be used for wheat cultivation is very carefully worked and attended to.	Rs. 2-2 per md.	55	234,785
			66	1,983,317

1	2					
Name of the district in which wheat is grown.	Annual imports into the district for five years, and places whence imported.					
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Places whence imported.
	Mds.	Mds.	Mds.	Mds.	Mds.	
1. Amraoti	30,978	34,950	49,572	11,789	55,681	From Central Provinces and from His Highness the Nizam's Dominions through the Bassim district.
2. Akola	...	...	...	...	...	From the neighbouring districts of Bassim and Buldana.
3. Ellichpur	...	...	...	...	...	From Hoshangabad and Betul in the Central Provinces and Amraoti district.
Buldana	7,005	11,662	14,271	15,543	17,427	From Central Provinces and His Highness the Nizam's Dominions.
5. Bassim	...	...	...	5,170	9,630	From His Highness the Nizam's Dominions.
Wun	1,405	1,07,732	1,24,117	86,999	1,11,461	From Central Provinces, His Highness the Nizam's Dominions, and the neighbouring districts of the province of Berar.
	39,388	1,54,344	1,87,960	1,19,501	1,94,299	

1	9								
	ANNUAL EXPORTS.								
Name of the district in which wheat is grown.	YEARS.					Places whither exported.	PROPORTION CARRIED BY		
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.		Road.	Rail.	River.
	Mds.	Mds.	Mds.	Mds.	Mds.				
1. Amraoti	12,565	7,412	97,783	2,910	11,349	To Bombay and Ellichpur.	½	½	...
2. Akola	...	...	...	...	...	To Bombay ...	...	...	...
3. Ellichpur	...	...	...	...	...	To Burhanpur and Khandwa in the Central Provinces, also to Amraoti.	1	...	...
4. Buldana	636	704	1,303	4,003	6,885	To Bombay, Poona, Khandesh, Nimar.	½	½	...
5. Bassim	18,723	56,080	64,948	68,669	1,00,556	To Bombay and other commercial towns.	1	...	...
6. Wun	1,918	2,166	1,420	3,151	1,680	To Central Provinces, His Highness the Nizam's territories and the neighbouring districts of Berar.	...	...	...
	33,842	66,362	1,65,454	78,733	1,20,470				

1	10	11		
Name of the district in which wheat is grown.	Estimated average cost of cartage to the railway station nearest to the district.	Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by		
		Rail.	Road.	River.
1. Amraoti	Railway runs through the district.	Rs. 2½ per 640 lbs. ...	...	...
2. Akola	Ditto ditto	.....	...	...
3. Ellichpur	.....	.....	...	...
4. Buldana	Railway runs through the district.	Rs. 2½ per 640 lbs. ...	...	...
5. Bassim	.....	Rs. 2½ per 640 lbs. ...	...	...
6. Wun	.....	.....	...	...

1	12	13
Name of the district in which wheat is grown.	Local names for the varieties of wheat cultivated, and their description in English.	A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.
. Amraoti	Bansi, yellowish, fat, somewhat flat at both ends. Kathia, reddish, hard thin, and pointed at both ends. Tode, brown, fat and flat on both ends. Chawul kathia, same as kathia, but a little more pointed at both ends. Bansi is said to be best for food, and the market value is a little above the other description of wheat.	
2. Akola	Kathi, reddish, soft and heavy. Bagad bansi, yellowish, red, light and hard. Bansi, yellowish and soft. Chand kathi, a species of kathi.	
3. Ellichpur	Bansi or kaliabul, yellow and clean; potia or gaida of medium quality; kathia or harway, inferior.	Total area under wheat in 1876-77=537,830 acres. Average outturn per acre =2¼ lbs. Total outturn=1,171,701 cwt.
4. Buldana	Bansi or baxi, best quality, yellowish brown. When this kind of seed is irrigated, the grain is larger than that grown as dry crop and is thin. Ghode, baxi, kathi or kathode, smaller than the bansi, reddish brown. Pote or kawade inferior quality and smaller than the other two varieties. These varieties are subdivided according as they are sown as dry crop or irrigated.	
5. Bassim	Kathi, poti, cowde and bansi or baxi.	
6. Wun	The local names for the varieties of wheat are few, and they are known to but very few, and their meaning to none of those who have been questioned on the subject, and who were likely to have a proper knowledge of them. The two general varieties of wheat are ordinarily distinguished by two common names, as "bandi," the yellow, and "jhambdi," the red.	

AMRAOTI;
The 13th March 1878.

T. W. STACY,
for *Commissioner, Hyderabad Assigned Districts.*

Memorandum to accompany statement showing production of, and trade in, wheat.

The acreage figures may be accepted. It will be seen that in 1876-77 the acreage under wheat largely increased. Wheat stands there in the proportion which its cultivated acreage bears to the whole cultivation of the province: thus—

Jowari	...	...	... 35·11
Cotton	...	...	... 31·57
Wheat	...	...	... 8·39

2. The amount of seed per acre given by the Deputy Commissioner, Bassim, is evidently too high.

3. The statistics afforded by the district reports regarding production, import, export and consumption may be presented as follows:—

	Amraoti.	Akola.	Ellichpur.	Buldana.	Bassim.	Wun.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Production ...	3,59,602	1,63,332	1,07,367	5,02,446	3,30,541	2,08,404
Import ...	55,581	Not given		17,427	9,830	1,11,461
Total ...	4,15,183	1,63,332	1,07,367	5,19,873	3,40,371	3,19,865
Export—Road ...	11,349	Not given		6,885	1,00,556	1,680
Rail ...	80,562	1,46,872	None	11,135	...	...
Total Export ...	91,911	1,46,872	Not given	18,020	1,00,556	1,680
Balance ...	3,23,272	16,460	1,07,367	5,01,853	2,29,985	2,06,724
Consumption ...	8,41,306	3,91,923	79,241	2,02,567	2,33,495	2,34,785

The two last lines of figures ought of course, if the estimates were accurate, to show some correspondence, and for two districts, Wun and Bassim, they do; but the figures of no district, except Bassim, seem worth much.

Amraoti.—Consumption has been very much overestimated, and might be reduced by half.

The imports seem to be doubtful. The trade returns show only 15,026 maunds imported in 1876-77 from the Central Provinces. On

the other hand, there has no doubt been a large import from Ellichpur the amount of which cannot be given; and if allowance is made for this, the figures showing balance left for consumption and estimated consumption (reduced) will not be very wide apart.

Akola.—The whole of the export of Bassim must have been an *import* of this district; and it is also certain that a still larger import into Akola came from Buldana. If allowances of this kind are made, what appears incorrect in most of the figures will be explained. But the fact is, that *district* statistics of import and export must be unreliable.

The import of Wun is suspiciously large. The trade returns show that less than 5,000 maunds came from the Central Provinces and Nizam's; and it seems unlikely that over a lakh of maunds should have come from other districts in Berar.

4. Taking the totals for the province, and omitting imports, which are comparatively small, the resulting figures seem probable enough: thus—

	Mds.
Production	... 16,71,686
Exports by rail ...	... 2,37,370
	14,34,316
Estimated consumption ...	... 15,62,664*

In other words, Berar exports 14 per cent. of its production, and consumes the rest.

5. The entries in the statement under column showing the proportion carried by rail and road are some of them of little value. For instance, there are no statistics of the export of Buldana to other districts in the province, and it is impossible to attain fairly accurate figures showing the trade of districts *inter se*.

6. A statement showing the railway-borne trade in the three years ending with 1876-77 accompanies this memorandum; also a statement showing the road-borne imports and exports of the province in 1876-77. It is worthy of note that Akola, which has never attracted cotton trade, exports more wheat than any other station.

The position with reference to Bassim probably determines the greater part of the wheat trade of that district to it.

The relied expansion of the export trade in wheat is made very evident by the railway returns.

T. W. STACY,
for *Commissioner, Hyderabad Assigned Districts.*

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* In this the consumption of Amraoti has been taken at half the amount estimated by Deputy Commissioner.

Trade in wheat with stations on the Great Indian Peninsula Railway in the Hyderabad Assigned Districts.

Stations.		1874-75.		1875-76. *		1876-77.	
		Mds.	S.	Mds.	S.	Mds.	S.
1. Mulkapur ...	Export	255	20	499	0	2,632	36
	Import	214	15	267	6	86	0
2. Nandura ...	Export	1,389	31	3,141	14	8,503	4
	Import	722	24	1,656	30	1,533	25
3. Jullum ...	Export	744	26	16,561	16	8,144	27
	Import	.....		63	24	667	34
4. Khamgaon ...	Export	4,014	12	24,881	8	63,966	6
	Import	11	10	.....		849	31
5. Sheagaon ...	Export	261	17	3,325	21	5,425	39
	Import	87	20	988	5	2,440	13
6. Parus ...	Export	1,242	33	1,165	23	612	3
	Import	16	27	.....		157	7
7. Akola ...	Export	11,213	19	38,291	19	68,725	39
	Import	56	26	2,023	38	2,900	3
8. Murtizapur ...	Export	669	9	33,919	17	25,080	18
	m port	215	39	.....		359	27
9. Budneera ...	Export	230	18	11,055	15	5,919	17
	Import	5,243	17	78	36	3,292	17
10. Amraoti ...	Export	135	9	29,385	2	24,497	7
	Import	5,226	13	582	14	3,273	10
11. Chandier ...	Export	281	32	13,243	29	25,060	21
	Import	1,645	12	.....		690	20
Total ...	Export	20,438	26	1,75,469	4	2,38,574	17
	Import	13,440	3	5,660	33	16,250	27

* The trade for one month, March, is wanting. Hence the totals for this year are somewhat below the truth.

Statement showing the road-borne trade in wheat in the Hyderabad Assigned Districts during 1876-77.

Frontiers.	Imports.	Exports.
	Mds.	Mds.
Northern Frontier	5,108	3,553
Eastern Frontier	19,426	9,599
Southern Frontier	33,492	9,593
Western Frontier	590	1,749
Total	58,616	24,494

Commissioner's Office, H. A. D.;
Amraoti, the 13*th March* 1878.

T. W. STACY,
for *Commissioner, Hyderabad Assigned Districts.*

No. 3784, dated Bombay Castle, the 18th July 1879.

From—J. B. PEILE, Esq., Acting Chief Secy. to Govt., Bombay,
To—The Secy. to the Govt. of India, Home, Revenue and Agricultural Department.

With reference to paragraph 5 of the Resolution of the Government of India, No. 1-140, dated 14th March 1877, I am directed to forward, for submission to the Government of India, a memorandum regarding wheat cultivation in the different districts comprised in this Presidency.

Memorandum regarding wheat cultivation in the Bombay Presidency, comprising particulars on the following heads.

1. The names of the districts in which wheat is grown.
2. The area (in acres) under wheat in each of the last five years to the end of 1876-77.
3. The average outturn (in pounds) per acre.
4. A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.
5. The average wholesale price of wheat.
6. Average consumption per head of the population of the district.
7. Total consumption within the district.
8. Annual imports into the district for five years, and places whence imported.
9. Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.
10. Estimated average cost of cartage to the railway station nearest the district.
11. Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river.
12. Local names of the varieties of wheat cultivated, and their description in English.
13. A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade.

Summary of reports regarding wheat cultivation in the districts comprised in the Northern Division.

The names of districts in which wheat is grown.

Wheat is grown in the following districts in this division :—

Collectorate.	Talukas.
1. Ahmedabad	In all.
2. Kaira (principally in)	Matar. Mehmadabad. Kapadwanj.
3. Panch Mahals	Dohad. Jhalod. North-east of Godhra. A little in Kalol.

Collectorate.	Talukas.
4. Broach	In all.
5. Surat	Olpad. Bardoli
6. Nasik	In all.
7. Khandesh	In all.

The area (in acres) under wheat in each district in each of last five years.

2. The following figures show the area under wheat cultivation in each of the districts named above :—

Districts.	1872.	1873.	1874.	1875.	1876.
Ahmedabad* ...	180,027	163,950	162,537	181,644	176,143
Kaira	7,071	7,487	9,445	14,644	11,251
Panch Mahals ...	8,980	6,190	9,500	13,560	13,950
Broach	73,752	55,934	63,194	77,878	78,799
Surat	27,441	26,312	21,003	24,052	22,863
Nasik	159,188	194,207	177,841	176,442	142,553
Khandesh ...	137,836	171,264	144,733	152,239	155,570
Total ...	594,295	625,344	588,253	640,459	601,129

Average outturn in (pounds) per acre.

3. The average outturn in pounds per acre is as follows :—

	lbs.	
Ahmedabad	258	chasia and 600 wadina.
Kaira	438	
Panch Mahals	250	
Broach	350	
Surat	400	in dry-crop land.
	600	in irrigated land.
Nasik	361	in dry-crop land.
	781	in garden land.
Khandesh	307	

Ahmedabad.—258 lbs. is the outturn of chasia. Wadina or wajia is said to yield 600lbs. per acre. But separate figures of the land sown with each variety and its outturn are not available.

Panch Mahals.—The average outturn of wheat per acre is ascertained to be 250lbs. in this district; the minimum amounting to 192 and maximum to 392 lbs., the average in main producing area, *viz.*, Dohad and Jhalod, being 390 lbs.

Broach.—There is some difficulty, the Collector says, in arriving at the average outturn in pounds per acre. In the better soils it is as much as 640 lbs.; while in poor soils, it may be as low as 240 lbs.; about 350 lbs. may be taken as the average of the district.

* *Note.*—This does not include unsurveyed talukdari and inam villages.

Surat.—The average outturn in akasia land throughout the collectorate is estimated at 10 maunds or 400 lbs., in wet lands 15 maunds or 600 lbs.

Khandesh.—The average outturn is variously estimated by the mamlatdars; but as these officers can only get their information by application to the kunbis, and as the cultivating classes here are extremely ignorant and keep no records, the information given is to be taken for what it is worth. The outturn is reported as follows in pounds per acre :—

	lbs.		lbs.
Dhulia	270	Pimpalner	296
Nandurbar	280	Shahada	333
Taloda	303	Virdel	126

Sauda, Chopra and Nasirabad from 100 to 200; Bhusawal, Jamner, Amalner, Erandol, Pachora and Chalisgaon, 250; Shirpur, 164.

Mr. Stormont, the Superintendent of the Government Model Farm, estimates the average outturn of dry-crop wheat in the neighbourhood of the farm at from 900 to 950 lbs. per acre; and he adds that irrigated fields are likely to produce even more, proportionate of course to the condition they may be in as regards manure.

Brief account of cultivation.

4. *Ahmedabad.*—There are two varieties of wheat, *viz.*, chasia, grown in the talukas of Dholka, Dhandhuka, Viramgam, Sanand, and Gogo; and wadina or wajia, grown in Daskrohi and Prantej. Chasia is of two kinds, *viz.*, kathia (red) and dandkhani (white): the former grows only in Dhandhuka, as it is believed that the saline sub-soil on the west of the river Bhogava is unfavourable to dandkhani. It is sown in light black soil without irrigation; 84 lbs. of seed per acre are used: no crop precedes or succeeds it, but sometimes, when cotton fails, wheat is substituted for it. The land intended for wheat is kept fallow and ploughed four times before the seed is sown. The first ploughing takes place before the setting in of the rains. Sowing is commenced at the end of October or at the beginning of November, and the harvest is in April. Wadina or wajia is sown on irrigated light sandy soil: 160 lbs. of seed per acre are required. It sometimes follows rice, jowari or bajri; but in such cases the outturn is small. It is cultivated in a similar manner to chasia; but three ploughings are found sufficient before the seed is sown, which operation is performed in December: the harvest is also in April. This wheat is liable to a disease called geru, gerwar or jeru, which is described by Mr. Lely as a sort of mildew. It only attacks wheat planted on irrigated land: it first shows itself by turning the young plant to a reddish colour, which gets more and more apparent as the disease asserts itself. No remedy appears to have been found for it. Chasia, on the other hand, suffers from frost, kapadi (an insect not unlike grasshopper), and other enemies.

Kaira.—Three different sorts of wheat are cultivated. The first, dandkhani or dudhia at Matar; the second dhola at Mehmadabad; and the third bhalia at Kapadvanj. The two last are known by the names of kathia and wajia respectively in all districts. Dudhia is

described as being a little inferior to No. 1 "white, Bombay," mentioned at page 2 of the printed correspondence forwarded with Government Resolution No. 2221 of 6th April 1877. The kathia is a hard grain of inferior description and brownish colour; and the wajia is a mixture of the two principal species. Rich black soil is the only one suited for the cultivation of dudhia: the other two can also grow upon rice lands. Half a maund (*i.e.*, 40 lbs.) of seed, is required per acre for the dudhia; and ¾ maund (60 lbs.) for the other descriptions. The richest black soil requires little or no manure. To ensure a plentiful harvest of the white grain, there ought to be no previous nor subsequent crop during the season. The ground before it is sown is ploughed three or four times; occasionally, it is said, as frequently as ten times. In other descriptions of soil manure is used—either cattle manure unmixed or mixed with human ordure; and other kinds of crops are cultivated both before and after the wheat. The season for sowing for all descriptions is from the beginning of October to the end of November, and that for reaping in the month of March following.

Panch Mahals.—Wheat is generally grown in black soil (basaltic stiff loam), and to a certain extent in baisar (basaltic mixed with light sandy loam). It is usually sown as a second crop, following rice or maize. The quantity of seed varies from 40 to 80 lbs. per acre; and the sowing takes place in November and December. After the removal of the first crops above referred to, the land is ploughed for wheat, and then has the clod-crusher passed over it to level the soil. The seed is then sown at the abovementioned rate in drills about one foot apart. Manure is seldom used. A cloudless cold weather is supposed to be very favourable to the growth of wheat, whereas cloudy weather renders the plant sickly; and if a shower falls during the growth of the plant, an attack of blight is inevitable, which discolours and otherwise damages the grain. The wheat damaged by blight is injurious to health, the natives believing it to produce diarrhœa.

Broach.—Wheat is sown in dry-crop land in black soil: no other crop is sown with it. It is principally cultivated in villages where the soil is too salt for cotton. From 40 to 60 lbs. of seed are required per acre. The times of sowing and reaping and the mode of cultivation are similar to those above described, with the exception that it is never sown twice on the same land in consecutive years: the land is allowed to lie fallow, or some other crop is grown. Manure is sometimes used.

Surat.—Black soil is preferred; and as kiari lands are bounded, they retain more moisture than jirayat, and are more productive. In these lands rice can be sown in July; and after the rice crop is cut in October, wheat can be sown in the same land in November. In such cases 20 or 30 cart-loads of manure are required to be used before the rice is sown. From 40 to 80 lbs. of seed are required per acre.

Nasik.—In talukas north of the Chandor range of mountains wheat follows bajri, kulthi and tili. It is sown in October and November, and reaped in March or April. In Malegaon it is generally sown in dry-crop land, which is manured for it. In Nandgaon, on the other hand,

it is grown a great deal on garden land, which also is manured. In the Baglan taluka it is cultivated in garden lands in February; elsewhere it is a cold-weather crop not requiring much rain. South of the Chandor, Dindori, Niphad and Yeola talukas wheat follows bajri or gram after a fallow of ten months. In these talukas wheat is sown in September or October, and reaped in January or February. After the harvest the land is ploughed, and two or three months after it is harrowed. After the first rain it is ploughed twice, the second set of furrows crossing the first. After the heavy rain of July it is again ploughed: finally it is harrowed and sown. In December wheat is sometimes attacked by blight which shrivels up the grain. In garden lands wheat follows konde and tag (hemp); in the Nasik, Sinnar and Igatpuri talukas sowing takes place in October, and reaping in February. Oil-seeds and mustard are sometimes sown between the furrows. Inferior wheat sometimes follows rice: in this case manure is necessary. The following is said to be the amount of seed required per acre:—

Malegaon	76 lbs.
Nandgaon	56 lbs.
Baglan	76 lbs. in garden land. 58 lbs. in dry-crop land.
Kalwan	80 lbs.
Chandor, Dindori	24 to 36 lbs.
Niphad and Yeola	
Nasik, Sinnar and Igatpuri ...	80 lbs. in garden land. 64 lbs. in dry-crop land.

Khandesh.—The sowing takes place in October or November, and is harvested about March: irrigated black soil is the best for it. From 45 to 75 lbs. of seed per acre are sown. Wheat sometimes follows (in alternate years) gram, tili, bajri, or tur; at other times gram is sown for the first year, bajri for the second, and then the land is used for five or six years for wheat.

Mr. Pollen, the Assistant Collector, thus writes respecting the talukas of Sauda, Nasirabad and Chopra:—

"Wheat is in this district a rabi crop. It is usually sown in the black plain of the Tapti. It is said that the radiation of heat from the trap formation is so great, that wheat will rarely grow within two miles of the foot of the hills. In any case the black alluvial clay of the Tapti valley is always preferred. The sub-soil of this clay is a yellowish earth, known as 'man,' and there is an entire absence of murum or rock often to the depth of 80 or 90 feet. This land is never ploughed for wheat sowing. It is simply 'wakhared' or hoed three or four times and exposed to the action of sun, rain and wind.

"Wheat is sown about the end of September or beginning of October.

"In order to test whether the land is ready, the cultivator goes into the field and takes up a handful of earth. If the clay sticks together in a ball, the ground is considered ready, and sowing commences.

"A shower or two, when the crop is shooting, usually proves beneficial, but is by no means indispensable. The crop will flourish provided the dew falls copiously, and the weather remains cool and seasonable."

The crop sometimes suffers from frost, but not often in Khandesh, and from diseases known as "suk" and "asuk," a kind of frizzling up.

Reaping commences about the beginning of February.

The course of principal rabi crops usually stands thus:—first year, gram; second year, wheat; third year, linseed. But wheat is sometimes sown after a crop of white tili, and still oftener alternates with a kharif crop.

About 50 lbs. per acre are said to be required for sowing purposes.

Average wholesale price.

5. As hardly any two of the Collectors have made their calculation on the same method, it is difficult to give the average wholesale price of wheat in a useful form. The following is approximate, calculating the Broach or Surat maund at 40 lbs. and the Bengal maund at 80 lbs.:—

		Average per maund.						
		Rs.	A.	P.		Rs.	A.	P.
Ahmedabad	Chasia from	2	14	6	to	3	3	10
	Wadina ...	2	10	6				
Kaira	... ...	2	10	6				
Panch Mahals	... ...	2	14	1				
Broach	... ...	2	10	11				
Surat	... ...	2	6	0				
Nasik	... From	1	9	4	in Chandor.			
	to	4	4	0	in Kalwan.			
Khandesh	... ...	2	1	4				

Average consumption per head and total annual consumption.

Collectorate.	Average consumption in pounds.	Total consumption in maunds (80 lbs).
Ahmedabad	120	12,44,454
Kaira	11	1,02,532
Panch Mahals	7½	19,100
Broach	Not known.	Not known.
Surat	Ditto.	Ditto.
Nasik	32	2,89,400
Khandesh	20	4,83,262

The information on the above points is meagre and untrustworthy: this is exemplified by the following remarks.

Ahmedabad.—The Collector owns that his estimate is the result of guess-work. He thinks that one-fourth of the population (829,637) eat

wheat; and he puts 6 maunds as the average annual consumption for each member of the wheat-eating population, and considers the supply in the whole of the Ahmedabad district is just about sufficient to meet the demand.

Kaira.—The Collector shows that about 1,02,532 maunds are consumed a year in the Kaira district—some are imported, little exported; but there is no certain information on these points.

Panch Mahals.—Mr. Wilson writes: "The average annual consumption of wheat per head of the population of the district amounts to 70 lbs. The bulk of the population use chiefly bajri and maize for their bread; only well-to-do Banias, Brahmins, &c., use wheat as a part of their daily food." This accounts for the small average consumption.

Broach.—Mr. Loch writes: "This is not a point on which any information worth having can be given. The lower classes who form the bulk of the population do not eat wheat as a rule. It is only the upper classes with whom it is a staple article of food. The Jambusar Mamlatdar puts the average consumption at 80 lbs. a man; the Wagra Mamlatdar at 60 lbs.; and the Ankleshwar and A'mod Mamlatdars give the average of 19 lbs. per head. Similarly there are no data on which an opinion can be formed as to the total consumption in the district. The mamlatdars give figures which are mere guesses and from which no useful information can be obtained."

Nasik.—The average consumption per head varies from 4 lbs. in Chandor to 118 in Nandgaon.

Khandesh.—The average varies from 8 lbs. in Jamner to 88 in Dhulia.

Imports and exports.

Again the information on the heads noted in the margin is meagre and untrustworthy: the figures showing what amount of wheat has been carried by rail are not available, not being shown separately from other grains in the railway accounts. The Collector of Ahmedabad reports that a little has been exported to England, and that during the past year it has been imported to some extent from Jubbulpore, to meet the deficiency of food-grains caused by the export of grain to the famine districts.

Kaira.—Wheat is only grown in three talukas in Kaira. The Collector calculates the imports to reach an annual average of 51,272 Bengal maunds. The data are imperfect, and he has none regarding the exports.

Panch Mahals.—The average annual imports are 6,398 maunds, coming from Malwa, Central India, and a very little from Guzerat. The exports amount to an annual average of 39,214 maunds. Wheat is exported to British Guzerat, Baroda, and surrounding Native States, and to Malwa.

Broach.—A little is said to be imported at Ankleshwar from 200 to 500 Broach maunds, but none is imported north of the Nerbudda. The exports are very considerable, principally by sea from Tankaria in Jambusar, Dehej in Wagra, and by sea and rail from the city of Broach. It is exported to Bombay and to other parts of Guzerat and Baroda. To quote Mr. Loch, "taking the district according to its natural division, we may say that of the wheat grown between the Mahi and the

Dhadar, two-thirds goes by water from Tankaria, and one-third by road inland. Of the wheat grown between the Dhadar and the Nerbudda, rather more than half goes by water from Broach and Dehej, and the rest by rail to Bombay, Surat, &c. Of the wheat grown between the Nerbudda and the Keem, one-eighth goes inland by road, one-eighth goes by sea, and three-fourths by rail. The Bombay, Baroda and Central India Railway returns do not show the exports of wheat as distinct from other grains. The exports of wheat for five years from the port of Broach are as follows :—

	Cwt.
1872-73	1,268
1873-74	8,833
1874-75	6,835
1875-76	10,785
1876-77	14,386 "

Surat.—No information available.

Nasik.—The imports (a great part of which is simply brought to the railway for transmission to Bombay) are from the Nizam's territory, Malwa, Berar and Ahmednagar, and average 37,496 maunds. The average exports (almost entirely to Bombay) are estimated by the Collector to be by—

Rail ... ... 52,296 maunds.
Road ... ... 40,788 „

Khandesh.—The imports average 98,463 maunds, and are from the Central Provinces, Holkar's and the Nizam's territories and Cawnpore. The exports to Bombay, &c., average 1,15,400 maunds.

Average cost of cartage to railway station. Cost of transit to port of shipment.

The following table gives information on these points :—

District.	Cartage per mile per maund to railway stations.	Cost of transit by rail to port of shipment per ton per mile.
Ahmedabad	About 1 pie ...	About 8 pies per mile.
Kaira	„ 1¼ pie ...	„
Broach	„ 1 pie ...	„
Surat	„ 1¼ pie ...	„
Nasik	„ 1 pie ...	About 10 pies.
Khandesh	„ 1 pie ...	„

For the Panch Mahals, on account of extraneous causes, it would be misleading to give the cost of cartage alone per mile. The total cost of transit from Dohad and Jhalod to port of shipment (Bombay) amounts to Rs. 28-9-2 per ton, Rs. 14-6 for road and Rs. 12-11-2 for rail transit, and Rs. 1-8 for Baria transit duty ; while the rates from Godhra and Kalol, where this transit duty is not levied, are Rs. 15-3-2 and 13-6 respectively.

The following table is appended to show the cost of carriage of a ton of wheat from the principal wheat-growing places in the Northern Division :—

District.	Town.	Cartage.	Rail.	Water.	Total.
		Rs. A. P.	Rs. A. P.	Rs. A. P	Rs. A. P.
Ahmedabad ...	Dholka ...	2 10 0	12 6 8	...	15 0 8
	Dhandhuka ...	4 6 0	15 2 9	...	19 8 9
	Viramgaon ...	...	13 12 1	...	13 12 1
Kaira ...	Matar ...	2 0 0	11 4 0	...	13 4 0
	Kapadvanj ...	4 4 0	11 4 0	...	15 8 0
Panch Mahals...	Godhra ...	2 8 0	12 11 2	...	15 3 2
	Dohad ...	15 14 0	12 11 2	...	28 9 2
	Kalol to Baroda ...	3 4 0	10 2 0	...	13 6 0
Broach ...	Broach ...	...	8 8 0	...	8 8 0
	Wagra ...	2 0 0	8 8 0	...	10 8 0
	Jambusar ...	0 14 0	...	5 4 0	6 2 0
	Dehej ...	...	...	3 8 0	3 8 0
	Ankleshwar ...	...	8 6 0	...	8 6 0
Surat ...	Bardoli ...	4 8 0	6 2 0	...	10 10 0
	Olpad ...	3 0 0	6 2 0	...	9 2 0
Nasik ...	Lasalgaon ...	...	7 9 8	...	7 9 8
	Malegaon ...	1 12 0	8 7 0	...	10 3 0
Khandesh ...	Dhulia ...	4 14 8	10 6 8	...	15 5 4
	Jalgaon ...	...	14 1 10	...	14 1 10

Local names for the varieties of wheat cultivated, and their description in English.

District.	Local names.	Description in English.
Ahmedabad ...	Chasia { Kathi ...	A superior red grain, unirrigated.
	Chasia { Dandkhani ...	A plump white grain, unirrigated.
	Wadina ...	A small inferior red grain, irrigated.
Kaira ...	Dandkhani ...	Smooth grained, white.
	Dhola or kathi ...	Hard grained, brownish.
	Bhalia or wajia ...	A mixture of the above two.
Panch Mahals...	Dandkhani ...	White-brown, very clear and full.
	Kathi malvi ...	Not so full as the above, with a mixture of inferior reddish wheat.
	Kathi dahudi ...	Thin, hard and not full; a mixture of white-brown and reddish grain.
	Wajia ...	The worst kind, dull brown, with very small but soft grain.
	Gomadin ...	Degenerated species of dandkhani, of dull white-brown, with thin and shrivelled grain.

Local names for the varieties of wheat cultivated, and their description in English—continued.

District.	Local names.	Description in English.
Broach ...	Hansia ...	The commonest sort. The grain is large, long and brown.
	Potia ...	Is smaller, white and rounded.
	Kathi ...	Is large, rounded and very brown.
	Jiva ...	Is the smallest of the grains and is not so brown as kathi.
Surat ...	Hansia ...	*Vide* description given for the Broach hansia and potia.
	Potia ...	
Nasik ...	Bansi ...	Soft, yellow, large-grained.
	Piwla or bansi ...	Soft, reddish grain, middling sized.
	Bansi or dandkhari ...	Soft, yellow grain, middling sized.
	Kathi ...	Hard, red, small-grained.
	Kathi poti ...	
	Kaodi or kapli ...	
	Poti ...	Soft, yellow, small-grained.
Khandesh ...	Piwla bansi ...	Of yellowish colour, large, full, but grows only on the best soil.
	Piwla potia ...	Yellow, short and thick.
	Lal potia or kathi ...	Inferior red wheat; hard in texture and pointed at both ends.
	Berad ...	Inferior reddish wheat; grain sometimes shrunken.
	Gore ...	Yellowish, rather full.

From the above it will be seen that in the Guzerat districts two or three descriptions are generally sown, some of the varieties being white and others red. The names in Khandesh and Nasik vary from those given in Guzerat and apparently in the qualities also.

General Summary.

The following table shows the area under cultivation, the average outturn as estimated by Collectors, and exports and imports as estimated for each district in the Northern Division :—

District.	Average area under wheat in acres.	Average outturn in lbs. per acre.	Total outturn in maunds of 80 lbs.	Imports in maunds.	Exports in maunds.
Ahmedabad...	172,860	258 chasia ... 600 wadina ...	12,50,000	No information available	No information available.
Kaira ...	9,980	438	54,640	51,272	Ditto.
Panch Mahals	10,436	250	44,427	6,398	39,214
Broach ...	69,912	350	2,76,683	No returns available	No returns available.
Surat ...	24,334	400 in dry land 600 in irrigated land.	1,15,841	Ditto	Ditto.
Nasik ...	170,046	361 in dry land 781 in irrigated land.	5,76,117	37,496	93,084
Khandesh ...	153,570	307	4,10,842	98,463	1,15,400

The inquiries that have been made with the object of obtaining the information asked for by the Government of India have proved very

conclusively that the district officers are quite unable to furnish most of the details required.

Certain figures are available showing the area under wheat; but even these are frequently not reliable. It may, however, be admitted that the figures given to show the area under wheat are fairly accurate; but on the other points the details furnished are manifestly not to be relied on, and are admitted to be so. This remark applies not only to the outturn per acre, but also to the total outturn, and to the amounts imported and exported.

It is no easy thing to estimate the outturn, especially in a country of small holdings, in which the quality of soil varies greatly, and when the cultivators do not know, and when those who perhaps could do not wish to state what the actual outturn is.

The general tendency of cultivators is to underestimate the amount of their crop; and the average outturns stated by the Collectors are rather low. But, on the other hand, crops vary so much, some are very light, hardly a span in height; while in some fields, owing to bad seed received from the money-lender, a very partial crop has come up. In others again, especially where mahajans are numerous, the crops are so much damaged by herds of wild antelopes, that a high average could not be expected. Still, admitting all this, it appears that the figures about outturn are too low.

As has already been stated, the outturn varies so greatly that, unless the qualities of soil are taken, and the amount of good, indifferent and bad soil sown with wheat is known, it is almost impossible to give any "average": the average should first be for each distinctive class of soil according to area, and then a general average might be struck.

Still certain facts are shown—that upwards of 600,000 acres of land are annually sown with wheat; that in places there is a fairly good outturn; that some of the qualities are well suited for exportation.

Further, it cannot be doubted that the area under wheat could at once, if the growers were satisfied that the course would pay them well, be largely increased; that with more care the outturn might be much larger; and lastly that, if the transit duties now levied by many States were abolished, or even reduced within reasonable limits, a large area now practically excluded from the market might be added to it. This last is a point of very considerable importance, as the tendency on the part of many petty rulers is to increase transit duties, which naturally has the effect of strangling trade. It has been asserted that the present export trade in wheat owes its origin to the repeal of the export duty on wheat of 3*d.* or 3½*d.* per bushel; and if this is the case, the relief to trade, and the impetus that would be given to it by the repeal of these transit duties, would surely be very great.

Summary of reports regarding wheat cultivation in the districts comprised in the Central Division.

Names of districts in which wheat is grown.	The following are the districts in which wheat is grown:—
Ahmednagar.	Poona.
Satara.	Sholapur.

The area (in acres) under wheat in each of the five years to the end of 1876-77.

	Years.	Area in acres.	
Ahmednagar	1872-73	11,471	
	1873-74	17,182	
	1874-75	13,407	
	1875-76	13,907	
	1876-77	4,545	
Satara	1872-73	25,608	14 gunthas.
	1873-74	26,730	17 ,,
	1874-75	24,791	17 ,,
	1875-76	22,956	25 ,,
	1876-77	15,710	19 ,,
Poona	1872-73	69,263	
	1873-74	57,611	
	1874-75	65,249	
	1875-76	61,479	
	1876-77	31,961	
Sholapur	1871-72	Information incomplete.	
	1872-73	40,568	
	1873-74	42,898	
	1874-75	43,806	
	1875-76	38,573	

The average outturn (in pounds) per acre.

	Years.	lbs. per acre.
Ahmednagar ...	1872-73	112
	1873-74	109
	1874-75	108
	1875-76	127
	1876-77	95
Satara		328

Poona.—The average outturn in pounds per acre is variously estimated at from 100 to 300 lbs. The Collector considers it impossible to obtain correct information on this head without actual experiments. Judging, however, from the returns of crop experiments made during the last three or four years, 300 lbs. would appear to be approximately correct. In properly irrigated land, the outturn may be put down at from 900 to 1,200 lbs. per acre.

Sholapur.—The Collector reports that the average outturn is very variable.

A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.

Ahmednagar.—There are three principal kinds of wheat, *viz.*, bakshi, kathi and jod. Bakshi wheat requires to be sown in bagayat or irrigated land. About 4 payalis equal to about 48 lbs. of seed are sown in one acre of land.* Wheat follows the bajri crop.

* This fact alone proves the returns for Ahmednagar under this head to be incorrect; for no one would sow wheat if the return amounted to only from twice to treble the weight of seed planted.

It is generally sown in the months of November and December. If rain falls when the plants arrive at maturity, a full crop is reaped. Foggy or misty weather produces blight. For kathi wheat a black rich soil is generally preferred. About three payalis of seed equal to about 36 lbs. are sown in one acre of land in the months of October and November. Jod wheat requires bagayat or irrigated land. About nine or ten payalis of seed equal to about 120 lbs. are sown in one acre of land in the months of November and December.* Jod wheat does not suffer from any disease.

Satara.—Wheat is sown in three kinds of land—bagayat, jirayat and tari—in this district. Quantity of seed sown per acre averages from 50 to 40 lbs. Khapli, a kind of wheat, is the only one which is made to follow some other crop. Khapli sowing commences in January, and other kinds in October.

Poona.—Black or rich brown soil is required for the cultivation of wheat. Alluvial soil is the best, and is called "gavhali." Bakshi gahu is grown on this. The finest crops of khapla or jod gahu are produced in irrigated fields.

In irrigated land wheat is sown in September and October, the quantity of seed per acre varying from 30 lbs. to double that quantity in the land near the Ghâts, where the rainfall is heavy. Khapla wheat is sown as a second crop in irrigated land in January and February. In bagayat land, after a crop of bajri, maka (Indian-corn), tobacco, chillies or wheat itself, a good crop of wheat may be obtained in the same year. In dry-crop land, if bajri, maka, tobacco or chillies are grown in one year, wheat grows well in the next year. The harvest time is February and March. The best soil is low-lying black, or better brown clay, soil, where moisture is accumulated by the drainage of the surrounding higher ground.

Sholapur.—Best black soil is preferred for wheat cultivation. No proper rules of rotation, as the quantity grown in this district is small. The seed required per acre is 16 lbs. Wheat is sown in October, and reaped in February.

The average wholesale price of wheat.

	Year.	Per palla or 360 lbs. Rs.	A.	P.
Ahmednagar ...	1872-73	10	10	0
	1873-74	9	9	0
	1874-75	9	7	0
	1875-76	9	14	0
	1876-77	19	1	0
Satara ...	... ...	29½ lbs. per rupee.		

Poona.—The average wholesale price of wheat during ordinary years is put down at Rs. 3 per maund, or about Rs. 8 per palla.

Sholapur.—45 lbs. per rupee.

* Here the Ahmednagar information is again very defective and unsatifactory. No explanation is given why one acre of irrigated land requires twice as much seed as one acre of unirrigated land. On the contrary, as so much of the irrigated land is taken up by the watercourses and small pats or embankments, the seed required ought to be less for an irrigated than for an unirrigated acre.

Average consumption per head of the population of the district.

	Year.	Average consumption per head of population in lbs.
Ahmednagar	1872-73	14
	1873-74	17
	1874-75	15
	1875-76	16
	1876-77	5
Satara		14¾

Poona.—The average consumption per head of the population of the district varies from 7lbs. a year in Khed to 42lbs. in Purandhar. None but the wealthiest classes eat it daily.

Sholapur.—Information not furnished.

Total consumption within the district.

	Year.	Total consumption in maunds (one maund being equivalent to 82 lbs.).
Ahmednagar	1872-73	7,694 maunds.
	1873-74	11,746 „
	1874-75	8,741 „
	1875-76	10,200 „
	1876-77	2,797 „
Satara		4,074,826 7/10 lbs.
Poona		39,619,000 „

Sholapur.—Information not furnished.

Annual imports into the district for five years, and places whence imported.

Ahmednagar.—As a rule, wheat is not imported in this district. Some are imported from His Highness the Nizam's territory, but there are no means of ascertaining the extent of such imports.

Satara	1872-73	4,860,637 lbs.	From Bombay *viâ* Chiplun by sea; from Bombay *viâ* Poona by rail.
	1873-74	4,799,481 „	
	1874-75	5,077,090 „	
	1875-76	5,172,325 „	
	1876-77	4,029,848 „	

Poona.—The information as regards the annual imports and exports cannot be supplied, as no returns are available. But it appears that in ordinary years the imports are inconsiderable. Owing to the failure of local crops in 1877, large quantities were imported into Poona from the North-West of India. Wheat is sometimes imported to a small extent from Ahmednagar and the Nizam's territory. Exports are mostly made to Sholapur by rail and Tanna by bullock carts.

Sholapur.—Information not furnished.

Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.

		Exports in mds.
Ahmednagar	1872-73	49,172
	1873-74	85,641
	1874-75	61,127
	1875-76	78,527
	1876-77	9,882

Wheat is generally exported to Poona, Bombay, Nasik and Karmala in Sholapur. Cart roads are used for conveyance up to Dhond on the South-Eastern Railway line, and Lasalgaon on the North-Eastern Railway line.

Satara ...	1872-73	...	41,786 lbs.	To Chiplun and Mahad in Ratnagiri and Kolhapur.
	1873-74	...	39,609 „	
	1874-75	...	90,601 „	
	1875-76	...	72,044 „	
	1876-77	...	55,453 „	

Sholapur.—Information not furnished.

Estimated average cost of cartage to the railway station nearest the district.

Ahmednagar.—From Ahmednagar to Dhond railway station, Rs. 5 per cart; from Kopargaon to Lasalgaon Rs. 3 per cart.

Satara.—From Karad and Walwa to Poona railway station, cartage Rs. 15 and 16 respectively; Tasgaon to Kurduchi Wadi (Barsi Road) railway station, cartage Rs. 17-8.

Dahiwadi to Diksal railway station, Rs. 6.

Poona.—The cost of cartage is from 2 to 4 annas per kos of two miles, according to the nature of the season.

Sholapur.—The Great Indian Peninsula Railway passes through the district. The distance to Bombay ranges from 200 to 300 miles.

Cost of transit to port of shipment, Calcutta, Bombay or Kurrachee, by rail, by road and by river.

Ahmednagar.—No trustworthy information obtainable, but a cart-load of wheat containing about 1,440 lbs. cost from Rs. 5 to 7 as railway charges from Dhond and Lasalgaon stations to Bombay.

Satara.—To Bombay *viâ* Chiplun by road and sea; cartage from Karad Rs. 12-8.

To Bombay *viâ* Chiplun and Mahad by road and sea; cartage from Man taluka, Rs. 16 and 12 respectively.

Poona.—From the railway stations in Bhimthadi to Bombay the rates are from 4 annas 4 pies to 5 annas 2 pies per 80 lbs. From Haveli the rates would be a pie or two less; from Purandhar the wheat would be mostly sent to Poona by bullock carts, and thence by rail. The cost of transit from Khed to Poona is about Rs. 4 and to Talegaon, nearest railway station, Rs. 3 per ton. From Junnar to Talegaon the cost is about Rs. 6 per ton.

Local names for the varieties of wheat cultivated, and their description in English.

Ahmednagar.—Bakshi wheat is of a yellowish colour, and of a large size; kathi wheat is of a brownish colour; jod wheat is still more brownish and very fine in size.

Satara.—Khapli, bakshi, kathi, sheti and bansi.

Poona.—Bakshi is the best kind of wheat. The other kinds are khali kusal, kathi, khapli or jod, dandkhari, and poti gahu.

Sholapur.—Sheti gahu (a dry crop) and khapli or jod gahu (an irrigated crop) are the local names of the wheat cultivated in this district.

Summary of reports regarding wheat cultivation in the districts comprised in the Southern Division.

Names of the districts in which wheat is grown.

Wheat is grown in the black soil talukas of Navalgund, Ron, Gadag, Hubli, and portions of Dharwar and Bankapur in the Dharwar district; in the talukas of Sampgaon, Parasgad, Athni, Chikodi, Belgaum and Gokak in the Belgaum district; and more or less throughout the Kaladgi district, especially in the Mudebihal, Sindgi, Bagewari and Bijapur talukas on lands bordering on the banks of the Don nalla, a sluggish stream, the water of which is of a brackish or saline quality. The wheat grown in this region has a high local reputation.

The area (in acres) under wheat cultivation in each of the last five years to the end of 1876-77.

2. The following table shows the area under wheat cultivation in the several talukas named above during each of the years from 1872-73 to 1876-77 :—

District.	Talukas.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.
Dharwar.	Navalgund ...	132,685	158,670	112,164	130,254	*8,451
	Ron ...					
	Gadag ...					
	Hubli ...					
	Dharwar ...					
	Bankapur ...					
Kaladgi.	Indi ...	8,895	8,729	8,298	9,532	763
	Mudebihal ...	8,905	10,980	10,507	11,666	125
	Sindgi ...	12,045	14,350	13,506	15,198	361
	Bagewari ...	26,000	30,754	25,669	34,806	84
	Bijapur ...	19,412	19,220	18,342	21,296	205
	Bagalkot ...	4,019	4,882	4,309	6,162	93
	Badami ...	2,801	3,982	2,319	3,393	3
	Hungund ...	10,179	11,254	9,472	9,926	656
Belgaum.	Belgaum ...	547	509	505	492	357
	Sampgaon ...	6,392	5,433	6,365	7,446	3,936
	Parasgad ...	22,004	23,786	16,220	24,438	475
	Athni ...	11,521	10,332	8,974	9,314	267
	Gokak ...	5,652	5,785	3,572	5,123	79
	Chikodi ...	1,759	1,647	1,535	1,009	406

* Dharwar, Hubli and Gadag only.

In consequence of the famine there was little or no cultivation in 1876-77.

The average outturn (in pounds) per acre.

The average outturn in pounds per acre is variously stated. In Dharwar it is said to vary from 298 to 65 lbs. : 200 lbs. may be taken as the average.

In Bagewari, Bijapur and Mudebihal it is said to be 384, 336 and 405 lbs. respectively. These are the principal wheat-growing talukas in the Kaladgi district, and produce the superior Don valley wheat.

The subjoined statement shows the average outturn in pounds per acre in the Belgaum district :—

Talukas.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Average for 5 years.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Belgaum	...	...	...	...	...	256
Sampgaon	92¾	93½	88¾	96	199	108
Parasgad	182	164	234	96	...	165
Athni	110	102	82	87	167	110
Gokak	76	82	300	240	...	152
Chikodi	150	131	123	130	...	135

Account of cultivation.

Wheat is generally sown in good, soft, black soil. The land is carefully prepared before the seed is put in. The sowing commences soon after the heavy burst of the north-east monsoon, which is generally in October.

Quantity of seed sown per acre.

The quantity of seed sown per acre varies in different places. It ranges from 24 to 40 lbs. in Dharwar, 26 to 30 lbs. in Kaladgi, and 12 to 32 lbs. in Belgaum.

The crop which wheat follows.

The crop which wheat follows best is said to be cotton, the latter being preceded by jowari. In some places it alternates with sugarcane, gram, &c. Occasionally kusumba, or safflower, is raised between the rows of wheat at a distance of 2 to 6 feet apart. It ripens one month later, and does not interfere with the growth of wheat.

Other particulars.

The wheat crop takes from 3 to 3½ months to ripen. When it is about 18 inches high, one good shower is considered necessary. Southerly winds are said to be injurious. Winds from the north and east are preferred. Excessively cold breezes cause a disease called "ittangi," which makes the wheat plants turn of a reddish colour and bear poor or no ears.

The average wholesale price of wheat.

Is about 31lbs. per rupee in Dharwar, 26lbs. in Belgaum, and 56lbs. in Kaladgi.

Average consumption per head of the population of the district.

It is difficult to give any correct information under these heads, as wheat is not the staple food of the people in the Southern Mahratta Country. It is only the rich and well-to-do classes who can afford to use it for ordinary consumption.

Total consumption within the district.

The poorer classes only eat wheat on holidays. The average consumption per head must, therefore, be very small. It is not possible in the absence of data to guess the quantity consumed within the district.

In the southern districts of Dharwar a small quantity of wheat is imported from the port of Kumpta. In ordinary years wheat is not imported into the Kaladgi district, while in Belgaum it is brought from the Dharwar and Kaladgi districts. The annual imports cannot be given for want of the necessary data.

Annual imports into the districts for five years, and places whence imported.

Wheat is exported from the Kaladgi district in considerable quantities, but what those quantities may be, or may average, there are no data to show, nor are they obtainable. It could possibly be ascertained what amount left each village, but it does not follow that it all goes out of the district. Some of it is at once expended; but much more goes to the various and numerous bazar towns, where it is bought up for immediate consumption and for export by different routes to the stations of Sholapur, Kopargaon and other places on the Great Indian Peninsula Railway. Some wheat leaves the Kaladgi district for Athni in the Belgaum district and Jamkhandi in the Southern Mahratta Country. More again goes to Vingorla and Karwar, and thence is shipped to Bombay.

Annual exports from the districts for five years, places whither exported, and proportion carried by road, rail or river.

The Collector of Belgaum states that it is impossible to give the exports with any accuracy. But, taking the figures given by the mamlatdars as approximately correct, it would appear that 73,650 maunds from Belgaum and 10,450 from Bidi talukas are annually exported to Goa, Vingorla and other ports on the coast, and thence to Bombay. A small quantity also goes to Kolhapur.

The exports from Sampgaon and Parasgad are estimated at 24,420 and 14,384 maunds.

The average exports from Athni during the past five years are computed at 45,000 maunds, while there are none from Gokak, and those from Chikodi are very trifling.

The wheat from Athni finds its way to Belgaum, Kolhapur, Vingorla Chiplun and Rajapur.

Estimated average cost of cartage to the railway station nearest the district.

Bellary railway station is nearest to the Dharwar district. The cost of carriage to it is ordinarily about Rs. 12 per half-ton.

The ordinary rate for a cart containing 7 bags (about 1,232 lbs.) to the Sholapur railway station from Bijapur, Bagewari and Mudebihal in the Kaladgi district is Rs. 6, 8 and 16.

No wheat is carried to any railway station from any part of the Belgaum district. The nearest railway stations are Poona and Barsi, distant 210 and 140 miles from Belgaum. The cart-hire to these stations varies from Rs. 10 to Rs. 20. About 1,000 lbs. form a cart-load.

Cost of transit to port of shipment by rail, by road and by river.

The hire of a cart to the ports on the sea is as follows :—

From Dharwar to Kumpta or Karwar	...	Rs. 12
From Belgaum to Vingorla,	...	„ 8 to 10

The cultivators of Kaladgi do not send grain on their own account to Bombay, or even to Vingorla. They either take it for sale to the towns where there are railway stations, or they dispose of it to traders at Belgaum, the cart-hire to which from the central town of Bagalkot would be about Rs. 12 in ordinary times.

Local names for the varieties of wheat cultivated, and their description in English.

There are three varieties, known as—

1. Tambda gahu.
2. Khapli gahu.
3. Holi gahu.

The first variety is the best kind of wheat cultivated, and bears in its general appearance a close resemblance to ordinary English wheat.

The second variety is a bearded wheat, and, when in the ear, resembles English barley in general appearance; but the grain is of more oblong shape. It is grown as an irrigation crop in garden lands.

The third variety is of an inferior kind, and is grown in rice lands after the crop has been harvested.

Summary of reports regarding wheat cultivation in Sind.

Kurrachee.—The wheat cultivation of this district may be said to be confined to the country north of Kotri. Some are grown in the northern part of the Tata taluka. The area under this crop in the rest of the district is very trifling, the spring fogs of the delta being very detrimental to it.

The names of districts in which wheat is grown.

The area (in acres) under wheat in each of the five years to the end of 1876-77.

2. The area under wheat during each of the five years to the end of 1876-77 is as follows:—

	Acres.
1872-73	29,344
1873-74	27,212
1874-75	58,779
1875-76	28,624
1876-77	50,837
Total ...	194,796
Average ...	38,959

The average outturn (in pounds) per acre.

The average outturn per acre is said to be about 600 lbs.

A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation and other useful particulars.

Wheat is a spring crop. The sowing commences about the 1st of November and ends by the 1st of January, and the crop is reaped in March and April. It is grown on land that has been under water during the inundation season, the soil, a rich clay, consisting of the silt deposited year after year by the flood-water; also on lands watered by floods from the western

hills, which also carry with them great quantities of silt; and to a small extent on lands watered by wheels erected on such canals, nalas or ponds as may retain water during the cold season. There is no well cultivation. The value of the crop is much enhanced if a water channel or pond be near on which a wheel may be erected, or the level of which may be artificially raised so as to give one or two waterings to the growing crop; but much first-class wheat is grown on land which receives no water after the inundation subsides.

No case can be cited of an inferior grain being sown with wheat, as a resource to fall back on should the latter fail or not fetch a remunerative price. It is not known when wheat has not fetched a remunerative price. As a rule, the cultivator spares neither trouble nor expense with this crop. The ground is carefully broken up, the seed drilled; the ground, on the whole, kept as clean as the rough implements in use will allow.

It is true manure is not used, and wheat is grown year after year on the same land; but the annual deposit of silt in a great measure neutralises the mischief of this. It is also true that much wheat is sown broadcast, and some even without ploughing the land at all; but this is done from necessity. If, owing to late subsidence of the inundation, the wheat lands are late in drying, there is no time to prepare them properly; the most is made of them that circumstances will allow.

But unfortunately the chances are ten to one that the cultivator is deep in debt; his crop when saved goes direct to the bania, he saves none of it for seed; and when he requires the latter, he has to borrow it again form the bania, and take such quality as the latter chooses to give him. Hence the seed is often considerably mixed with jamba or some other oil-seed; but as this comes to maturity before the wheat, the cultivator pulls it up, and little or none of it will be found in the wheat in the grain-yard. Certainly the cultivator's wheat might be cleaner; but it is after it leaves his hands that the real adulteration begins. It cannot be stated whether this is done at the river ports; but it is well known that the practice is regularly carried on in Kurrachee. The importers are natives; the exporters mostly Europeans. Little, if any, grain comes to the latter direct from the railway station. It is taken into the native town, there mixed chiefly with barley, and then taken back to the exporters' yards, where the barley is cleaned out again as far as is possible.

It cannot be much for the interest of the cultivator to keep his grain clean so long as a system like the above lasts; and there seems no way of putting an end to it but by bringing the growers and exporters into direct contact by means of the railway and by the gradual enlightenment of the native merchants. Until that is done, district officers are powerless to effect improvement. The quantity of seed used per acre is said to be 116 to 170 lbs.

The average wholesale price of wheat.

The wholesale price of wheat during the five years from 1872-73 to 1876-77 has varied from Rs. 1-8 to Rs. 2-8 per maund. Rs. 2 are given as the present price.

Local produce equals 38,959 × 600; and this plus imports and minus exports gives the local consumption. Such export as there may be through the western hills is too trifling to materially affect the calculation.

The average consumption per head of the population of the district.

Total consumption within the district.

There are no means of obtaining the information required.

Annual imports into the district for five years, and places whence imported.

Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.

There is no cartage. Grain is carried by camel or donkey to the nearest river port, and thence by river and rail to Kurrachee, or wholly by the river Keti. Bania traders pay about half an anna per mile per camel; and a camel carries 4 to 5 maunds. Taking it at 4½ maunds, and the average distance at 10 miles, the cost of carriage comes to 1 anna 1⅓ pies per maund.

Estimated average cost of cartage to the railway station nearest the district.

Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river.

River transit to Kotri, 4 annas per maund; rail to Kurrachee, 3 annas 2 pies per maund.

Local names of the varieties of wheat cultivated, and their description in English.

The following are the names of the various kinds of wheat grown in the Sehwan taluka of the Kurrachee Collectorate :—

Punbun bhallo.	Popri hulki.
Punbun gharo.	Kunuck achi.
Punbun hulko.	Kunuck goji.
Thori bhulli.	Kunuck gharhi.
Thori vichou vuh.	Kunuck.
Thori hulki.	Kuhno bhullo.
Popri bhulli.	Kuhno hulko.

Ganjo.

Hyderabad Collectorate.—The Deputy Collector of Naushahro in Hyderabad says: "In the Kandiaro and Naushahro talukas there is a great deal of wheat cultivated by wells. Well-cultivation is fast increasing. It is said that 472 wells have been constructed within the last ten years in the above talukas, and it is in these localities that the first improvement in the cultivation of wheat may be expected; for it would be difficult to induce the people to refrain from sowing the double crop which they at present get from the river lands until the advantages arising from clean-sowing and from preserving the crop from admixture with other grain are made manifest to them.

"From six to eight acres of wheat can be irrigated from one well: the amount of seed required for this area would be from 12 to 16 maunds. Under favourable circumstances the outturn should be about 90 maunds."

The following statement, furnished by the Collector, contains information on the several points:—

The names of the talukas in which wheat is grown.	The area (in acres) under wheat in each of the last five years to the end of 1876-77.					The average out-turn (in pounds) per acre.	A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation and other useful particulars.	The average wholesale price of wheat.	Average consumption per head of the population of the district.	Total consumption within the district.
1	2					3	4	5	6	7
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.					
Tando Division.	A. G.	A. G.	A. G.	A. G.	A. G.					
Talukas Guni, Badin, Tando Bago, and Dero Mohbat.	1,044 37	779 32	5,721 39	2,872 38	1,788 0	Guni 770 lbs.; other talukas 640 lbs.	The kind of soil preferred for wheat cultivation is light and silty, where grass and weeds do not flourish. The quantity of seed varies from 80 to 130 lbs. The seed is sown sometimes, but very rarely, as early as October, but generally in November, and sowing continues as late as January. The harvest begins in January and continues to end of March, reapings in April being rare. The method of cultivation is as follows. The land is first irrigated and then ploughed twice, sometimes oftener. It is then rolled over and levelled by means of a large wooden beam drawn over the land by oxen. Again it is ploughed: this time the plough has attached to it a hollow wooden tube, down which the seed is poured, as the plough is driven the seed falling behind the plough in the furrow it has just made. The roller is then again applied, and within a week the seed germinates; and nothing further is done to it until the time for watching the crops brings the whole family of the cultivator in the field to scare the birds from injuring it. Reaping is performed with a sickle, and the grain generally separated by driving oxen over it. The grain is then heaped in a yard until the day of division comes, the bataie, when the different claimants, owner, Hari, Pir, village, tradesmen, &c., all receive their a lotted share. In kachas (land thrown up by the river) the seed is generally sown broadcast without the land being at first ploughed.	Bs. 2-8 a maund of 40 seers of 80 tolas.	About ½ lb. per diem, as more than ¾ of the people never eat wheaten bread at all.	1,519,845 lbs., 18,093 mds.
Hala Division.										
Hala Taluka only ...	1,010 0	2,043 0	2,717 0	716 0	800 0	1,280 lbs.	.....	Rs. 2-10 per maund.	30 lbs.	81,000 mds.
Hyderabad Division.										
Hyderabad Taluka...	820 0	2,025 15	6,448 0	2,109 23	4,116 21	598 lbs.	.....	Rs. 3- per maund.	180 lbs., including city, where much is consumed.	1,36,875 mds.
Nausharo Division.										
Talukas Nausharo, Kandiaro, Moro and Sakrand.	19,297 5	22,827 16	25,060 22	24,808 22	27,713 8	From 656 to 820, average 749 lbs.	.....	Rs. 2-8 per maund.	55 lbs.	2,83,000 mds.

The names of the talukas in which wheat is grown.	Annual imports into the district for five years, and places whence imported.	Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.	Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river.	Local names for the varieties of wheat cultivated, and their description in English.
1	8	9	10	11	12
Tando Division. Taluka Guni, Badin, Tando Bago, and Dero Mohbat.	Annual imports 3,590 maunds for five years, as follows :— *Guni.* 2 000 From Hyderabad in boats. *Badin.* 600 *Tando Bago.* 150 *Dero Mohbat.* 840 From Hyderabad or Thar and Parkar.	From Guni taluka only, average about 3,000 maunds or 15,000 for five years to Hyderabad, five-sixth by boat and about one-sixth by camel.	.....	.....	*Guni taluka* { Goje—Thin, dark-coloured. Khodno—Small, thin, reddish. *Badin taluka* { Kathori—Very small, hard, dark-coloured; grown where water-supply abundant. *Tando Bago taluka.* { Khodno—Same as pambar khodno. *Dero Mohbat taluka.* { Garhi—Lowest sort, dark-coloured andsmall.
Hala Division. Hala Taluka ...	About 4,05,700 maunds for five years; average 81,140. From Shikarpur district, Naushahro division, and Hyderabad taluka. Sehwan, Ferozpur and Thar and Parkar, by boats and camels.	No export ...	.....	.....	Garhi khodno—Lightest, brown, soft, full in body.
Hyderabad Division. Hyderabad Taluka...	About 10,00,000; average 2,00.000 Only an estimate, there being no correct statistics.	2,50,000 maunds to Kurrachee by rail and 50,000 to Lower Sind (Tando and Shahbandar divisions) by river.	In boats by river to railway station at Kotri; estimated average cost from Hyderabad to railway station Kotri 1 anna per maund.	By rail from Kotri to Kurrachee 6 annas per maund.	Goje—Thin, dark-coloured grain. Garhi—Thin, dark-coloured grain. Khodno—Small reddish, inferior grain. Karar—Similar to khodno, but mixed with barley.
Naushahro Division. Talukas Naushahro, Kandiaro, Moro and Sakrand.	No import	About 397,083 maunds to Gidu Bandar by boats.	7 annas per maund	.....	*Naushahro Taluka.* { Kano—Bearded wheat. Thori—Awnless wheat. *Kandiaro Taluka.* { Goje—Thin, dark-coloured grain. Kano—Bearded wheat. Karar—Wheat and barley mixed. Thori—Awnless wheat. Geriri—Unknown. *Moro Taluka* { Makain—Very small round wheat. Kano—Bearded wheat. Thori—Awnless wheat. Pambar—Half barley. Goje—Wheat and barley mixed. *Sakrand Taluka.* { Thori—Awnless wheat. Pambar—Half barley. Karar—Half barley.

Shikarpur Collectorate.—Wheat is grown in the following talukas of the Shikarpur district,—Rohri, Syadpur, Ghotki, Mirpur, Ubauro, Sukkur, Shikarpur, Naushahro, Larkana, Labdarya, Kambar, Tigar, Kakar, Nasirabad and Mehar.

The names of the districts in which wheat is grown.

The area in acres under wheat in each of the last five years to the end of 1876-77 is as follows :—

The area (in acres) under wheat in each of the last five years to the end of 1876-77.

1872-73.		1873-74.		1874-75.		1875-76.		1876-77.	
A.	G.	A.	G.	A.	G.	A.	G.	A.	G.
172,093	5	150,700	7	215,457	32	185,942	5	224,475	9

The average outturn per acre is 720 lbs.

The average outturn (in pounds) per acre.

Wheat is grown on alluvial soil, the deeper the better; also on the rich red soil brought down from the hills bounding this Collectorate on the west. The best wheat is grown on land which has been submerged during the inundation season by the overflow from the river. When aided by two or three waterings from the river itself, or even from wells, the outturn is frequently double. When unaided by the additional supply of water, the outturn, unless seasonable rain should fall, is but scanty, and the quality of the grain is poor.

A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.

From 120 to 150 lbs. of seed per acre is sown with a rude drill. This crop is sown year after year on the same land, where it is covered with the fertilising overflow from the Indus; otherwise pulse, oil-seeds or vegetables are sown as rotation crops, the latter only on well-lands.

The season for sowing wheat is from the middle of November to the 8th or 10th January. The crop is ready for reaping from the beginning of May to the 8th or 10th June.

The average wholesale price of wheat at Sukkur is about Rs. 2 per maund of 84 lbs.

The average wholesale price of wheat.

The whole population of the Collectorate, 807,743, may be divided as follows :—

Average consumption per head of the population of the district.

Those who live upon wheat	...	191,000
Ditto rice	...	323,000
Ditto jowari and bajri	...	293,743
Total	...	807,743

It may be calculated that the consumption of wheat per head per annum is somewhere about 4½ maunds or 360lbs. Thus the annual consumption of wheat in this Collectorate would be 8,59,500 maunds.

It is shown above under heads 2 and 3 that the average acreage under wheat for the past five years is 189,733 acres 27 gunthas, and the average outturn per acre 9 maunds (720 lbs.), or for the whole area 17,07,602 maunds. By deducting the amount required for home consumption, a balance of 8,48,102 maunds is left for exportation.

Total consumption within the district.

The area of wheat cultivation fluctuates considerably, being in a great degree dependent upon the extent of the inundation. For instance, the acreage of wheat cultivation this year (1877-78), owing to the scanty nature of the inundation, will hardly amount to 10,000 acres.

Annual imports into the district for five years, &c. — No information furnished.

Annual exports for the same period, places whither exported, and proportion carried by road, rail or river. — A large quantity of wheat passes through Sukkur from the Punjab by river for export from Kurrachee. In some years we also get wheat from Kelat, which, after reaching Sukkur, takes to the river route.

No record has been kept of the quantity which thus passes through the country.

Estimated average cost of cartage to the railway station nearest the district. — There is no railway traffic in this Collectorate as yet. The average cost of carriage from Sukkur to Kotri may be estimated at from 3 to 10 annas a maund.

Local names of the varieties of wheat cultivated, and their description in English. — Subjoined are the names and description of the different varieties of wheat grown in this Collectorate :—

Gaj.—Large-grained and hard, one kind greyish white, the other reddish in colour.

Thori.—Light yellow colour, middle sized, plump green, not so hard as gaj, excellent flavour.

Kudoni.—Same colour as thori, small sized grain.

Goji.—Red in colour, very small, and plenty grain.

The names of the districts in which wheat is grown. — *Frontier District, Upper Sind.*—The Frontier District of Upper Sind is on the right bank of the Indus, and lies between longitude 68° 1′ E. and 69° 38′ E., latitude 28° 3′ N. and 28° 26′ N., or very nearly so—these figures representing Khaira, Garhi and Kashmor respectively. It is the most northerly district in Sind, touching the Derajat of the Punjab at its north-eastern corner and along its whole length of border from east to west, adjoining the territories of His Highness the Khan of Kelat. The district is divided into three talukas,—Kashmor, Thull and Jacobabad. The two first have the river Indus running along their eastern and south-eastern sides; but Jacobabad is altogether an inland taluka. The total area of the district in acres and square miles, and of each taluka, is given in the subjoined table :—

No.	Name of taluka.	Area in acres.	Area in square miles.
1	Jacobabad	391,680	474
2	Thull	623,076	968
3	Kashmor	330,400	471
	TOTAL ...	1,345,156	1,913

The two first-named talukas are the wheat-growing parts of the Frontier District. In Jacobabad wheat is grown after the floods have subsided, because no other but wheat and saran (rapeseed) crops can be grown under the circumstances. In talukas Kashmor and Thull the whole of the country lying between the Sind hollow and the river Indus has been from the earliest times a wheat-growing country. But after heavy floods, which have of late years swept over the whole district, wheat cultivation has been carried on extensively almost everywhere. Nearly 200 square miles of talukas Kashmor and Thull might be given solely to wheat cultivation, if we had the population to spare. But, now that there is a likelihood of the great Kashmor and Begari bund standing and keeping out the floods, it is quite possible that there will be a great reduction in wheat cultivation in these two talukas.

The area (in acres) under wheat in each of the last five years to the end of 1876-77.

The area under wheat cultivation during the last five years ending with 1876-77 is given in the following table :—

No.	Name of taluka.	Area under wheat, in acres.										Remarks.
		1872-73.		1873-74.		1874-75.		1875-76.		1876-77.		Total.		
		A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	
1	Jacobabad	2,570	0	13,142	12	13,915	4	9,338	28	11,220	0	50,186	4	
2	Thull ...	19,565	33	20,065	0	47,767	37	27,652	3	41,915	1	156,965	33	
3	Kashmor	13,000	0	10,523	22	23,065	38	21,572	32	23,334	32	91,497	5	
	Total	35,135	33	43,730	34	84,748	39	58,563	23	76,469	33	298,649	2	

The average outturn per acre is 392·5lbs., *viz.*, Jacobabad 154lbs., Thull 686lbs., and Kashmor 338lbs. per acre. The contrast between each taluka is very great, and it cannot but be considered as unusual. This year for some reason the wheat crops in the Thull taluka were splendid, some of the finest ever seen; whereas those in taluka Jacobabad were thin and poor, full of tares, and a great deal was blighted by the red blight commonly called "ratti" from "rat," "blood," in Sindhi. In taluka Kashmor, too, the wheat crop this year was not first rate; in many places it was blighted, and some of the other tracts were thick with tares.

The average outturn (in pounds) per acre.

The kind of land preferred for wheat is the sailab, with an admixture of a light sandy soil. Where sailab is near the river, an admixture of sand with the rich silt thrown up by the Indus makes a good soil for the crop. There the natural moisture drawn up by capillary attraction by the plant is sufficient, with the aid of a little seasonable rain, to ripen the

A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.

crop. On the drier land along the Begari in taluka Jacobabad, where there is a good admixture of kallai or salt in the soil, it requires a good deal of artificial irrigation to ripen the crop. This is also required on the red clay soil along the desert canal, which is a dry, thirsty soil, where the floods have not passed over it. This kind of soil is called "rappi." The average quantity of wheat put down in an acre of ground is about 118·6 lbs.; but it varies in the three talukas very much. For instance, in Jacobadad the average is given at 120lbs. per acre; but as the outturn was only 154 lbs., the past season is no criterion. There is no doubt that wheat failed in 1876-77; and no other result can be expected in taluka Jacobabad, as the land has become thoroughly impoverished by the floods. In taluka Thull the average quantity of seed sown per acre is 140lbs., and the yield is given at 686lbs. In taluka Kashmor the average amount of seed put down is 96lbs., and the yield per acre at 338lbs. There is no doubt the cultivators put down more seed on good soil than they do on poor and worn-out land. In taluka Thull the floods were diverted last year over new tracts of country by the bursting of the great protective bund in unusual places, and thus splendid crops were raised. But a great deal of land in this taluka round Udi, Mirpur and Makarkpur is now thoroughly worn out. Where formerly miles of wheat could be seen after a flood, not ten acres can be met with during a whole morning's ride. Indus water only enriches that land on which it can throw a lot of silt. Water that has filtered through miles of dense jungle has not a particle of silt left, and of course ruins any land it spreads over for more than two or three years.

Wheat is a rabi or winter crop. It follows in Sind the kharif crops of jowar, bajri, til, mothi and rahan. Wheat sowings begin in October, and are over by the end of December. Even that is too late, as crops put down then are liable to khas and blight. The proper time is between the 15th October and end of November, as the soil is first turned up earlier still than the 15th of October after the floods have subsided. The first turning up of the soil with the plough is called "kheri"; the second ploughing with the seed put down is called "narri."

The average wholesale price of wheat per kharwar of 22 maunds is given at Rs. 49, *viz.*, Jacobabad Rs. 57, Thull Rs. 47, and Kashmor Rs. 43 per kharwar. The kharwar varies in quantity all over Sind. In some places a kharwar of wheat is more than 22 maunds, going up to 25 maunds; in others it is even below 22 maunds. But the kharwar is not, like the maund, a certain weight, but a dry measure. The other smaller dry measures are the toya or dharri, about five seers. The patou is one-fourth of the toya and the chowthan, or a quarter of the toya. These are the dry measures in use in this district. The kharwar, commonly called "kharar," is a Persian word meaning the "donkey's load"; but the Persian kharar must be smaller, for no donkey could carry even the fourth of a Sindhi kharar.

The average wholesale price of wheat.

The average consumption per head of the population of this district for the last five years is given at 9·3 maunds; that is to say, 1·86 maunds per

Average consumption per head of the population of the district.

head per annum. This is a very small consumption; but in Sind wheat is not the chief staple of food, jowari taking first rank.

Total consumption within the district.

The total consumption of wheat within the district for the last five years is given at 9,47,380 maunds, that is, 1,89,476 maunds per annum. The quantity of wheat consumed in taluka Jacobabad during the five years is given at 2,26,925 maunds, or 45,385 maunds per annum; in taluka Thull at 5,05,975 maunds, that is, 1,01,195 maunds per annum. In taluka Kashmor 2,14,480 maunds are given for the five years, and for the year 42,896 maunds.

Annual imports into the district for five years, and places whence imported.

The annual imports for five years and places whence imported are given in the following table :—

No.	Taluka.	Place from whence imported.	Year.	Quantity of wheat, in maunds.	Remarks.
1	Jacobabad ...	Katchi, Kelat territory.	1872-73 ...	55,960	There are no imports from the Katchi into the other two talukas.
			1873-74 ...	40,880	
			1874-75 ...	45,950	
			1875-76 ...	49,000	
			1876-77 ...	35,900	
2	Thull ...	.....			
3	Kashmor ...	.....			
			Total ...	2,27,690	

Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.

The annual exports for the five years ending 1876-77 are given below for each year separately. The wheat was exported to Sukkur in the Shikarpur Collectorate for shipment to Kurrachee and other ports of Sind. The imports given above, therefore, only represent certain wheat which passed through Jacobabad on its way to that port.

No.	Year.	Jacobabad.	Thull.	Kashmor.
1	1872-73	3,124	65,356	9,104
2	1873-74	31,086	70,860	...
3	1874-75	10,512	3,08,414	49,367
4	1875-76	132	2,58,232	64,968
5	1876-77	22,440	1,35,918	50,443

The total amount of wheat exported therefore is in five years 10,79,956 maunds. From taluka Jacobabad grain is exported generally by land on camels and carts; but in the inundation season boats are sometimes

laden in the Nurwa near Jacobabad, and taken down the Begari canal to its head on the Indus, and thence they drop down to Sukkur. In taluka Thull the same plan is adopted in the Sonewah and Begari. In taluka Kashmor boats are used on the Desert canal, and, Kashmor being on the Indus, grain is exported chiefly by boat.

Estimated average cost of cartage to the railway station nearest the district.

The average cost of carriage per kharwar to Sukkur fluctuates from Rs. 5 to Rs. 6; and in the inundation season it rises to Rs. 7 and Rs. 8, owing to scarcity of conveyance, caused by the flooded state of the country. The nearest railway to Jacobabad is at present the Indus Valley line at Rukh near Shikarpur; but this is not open yet.

Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river.

The cost of carriage to the nearest port by boat, steamer and rail cannot be given, as grain is carried from this district to Sukkur, and no further. There is not a single grain-dealer in this district who ships grain on his own account direct to Kurrachee.

Local names of the varieties of wheat cultivated, and their description in English.

The local names of the varieties of wheat cultivated and their description in English are given below:—

1. *Jowali.*—Common wheat, mixed with barley.
2. *Thori jowali.*—A better kind, mixed with barley, but to a lesser degree.
3. *Garhi sanhi.*—Red, thin kind.
4. *Jowali kaisri.*—Yellow wheat, mixed with barley.
5. *Garhi sanhi thori jowali.*—Red, thin thori wheat, mixed with barley.
6. *Saf thori jowali.*—Clean thori wheat, mixed with barley.
7. *Kaisri thori.*—Yellow, flat wheat.
8. *Kaisri thori sanhi.*—Yellow, thin wheat.
9. *Thori.*—Purest and best of wheat, bala sars, beardless.
10. *Garhi thori.*—Red, flat wheat.
11. *Gaj.*—Reddish wheat.
12. *Saf thori sanhi.*—Clean but thin thori.
13. *Saf thori thulli.*—Clean, flat thori.
14. *Kaisri.*—Yellowish wheat.
15. *Khudain.*
16. *Kaisri garhi.*—Reddish yellow.
17. *Gaji jowali.*—Mixed.
18. *Gaji kaisri.*—Mixed.
19. *Thori achi.*—White, unbearded.
20. *Achi jowali.*—White, unbearded, mixed.
21. *Thori achi jowali.*—White, mixed.
22. { *Garhi gaji sanhi* / *Ratti marrial* }.—Red, thin, blighted.
23. *Rodi achi thori saf.*
24. *Chitti kaisri.*
25. *Thori chitti.*

The above are the principal names given by the muktiarkars of wheat grown in their talukas; but a great many are mere repetitions.

The principal varieties are jowali, thori, kaisri, khudain, gaji and rodi; the others are mere sub-divisions of all wheat. The thori is the finest; it is unbearded, and the admixture is caused by careless cultivation and carelessness in threshing and garnering. In the first place, wheat and barley are very often grown close together, and by carelessness in reaping and threshing the two kinds of grain get mixed up. Then, again, the seed-grain is not carefully stored or picked; it is stored by the grain-dealers in what are called "kothis." They are never properly cleaned out before they are filled again; and as the cultivators are mostly all indebted to the dealers, who also are the village money-lenders, they are obliged to accept any kind of grain offered to them, and the zamindars are as much at the mercy of the dealers as the cultivators themselves.

General remarks.

The total area brought under wheat during the past five years is given at 298,649-2 acres, that is—

	Acres.	R.	P.
In 1872-73	35,135	0	33
„ 1873-74	43,730	0	34
„ 1874-75	84,748	0	39
„ 1875-76	58,563	0	23
„ 1876-77	76,469	0	33

The average outturn per acre is given at 392·5lbs. for the whole district; that is, Jacobabad 154lbs., Thull 686lbs., and Kashmor 338lbs., per acre.

The total produce of wheat during five years was 18,29,854 maunds, from which 9,47,380 maunds were consumed in the district and 8,82,474 maunds exported to Sukkur and Shikarpur.

The wheat produce in each taluka during the five years was—

	Mds.
Jacobabad	96,529
Thull	13,45,764
Kashmor	3,87,561
Total ...	18,29,854 maunds, as follows:—

1872-73 ...	9,374	1,67,553	52,000
1873-74 ...	32,148	1,72,057	42,094
1874-75 ...	14,015	4,09,610	92,264
1875-76 ...	7,332	2,37,115	1,07,864
1876-77 ...	33,660	3,59,429	93,339
Total ...	96,529	13,45,764	3,87,561

The wheat imported from the Katchi amounted to 2,27,690 maunds, and was partly consumed in Jacobabad and partly exported to Sukkur and Shikarpur.

Carriage is by camels and carts in the dry season, and by camels, carts and boats in the wet season. There is no railway.

The rainfall is given below :—

Season	1872-73	...	8·10″
,,	1873-74	...	3·68″
,,	1874-75	...	8·35″
,,	1875-76	...	3·09″
,,	1876-77	...	6·92″
	Total	...	30·14″

in five years, so that no kind of cultivation is dependent on rain. The winter crops are much improved by one or two seasonable showers in January and February, and even early in March.

In conclusion, it is remarked that wheat cultivation, although very profitable about the second, third and fourth years, soon begins to impoverish the soil if it is dependent on floods passing annually over the land. The floods only do good when they carry the Indus silt; beyond that, they do more harm than good. The district officers think that it is a very short-sighted policy that fancies, because one or two years after floods splendid wheat crops can be so easily grown, that it is very profitable to have the floods coming over the land, and being saved all the labour and trouble of distributing Indus water by innumerable canals cut into the heart of the country; but such distribution is, as it were, the life-blood of the country and enriches the soil. The floods, though pleasant, impoverish it.

The area (in acres) under wheat in each of the last five years to the end of 1876-77.

Thar and Parkar District.—The following shows the area under wheat cultivation during the five years ending with 1876-77 :—

Year.	Acres.
1872-73	22,809
1873-74	12,982
1874-75	43,126
1875-76	11,896
1876-77 (approximate)	13,000
	103,813
Average of five years ...	20,762

The average outturn (in pounds) per acre.

Six hundred pounds per acre.

A brief account of the cultivation, showing the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.

Wheat is sown once a year, in the months of October and November. The ground is first prepared by being thoroughly watered, either by well irrigation or by water allowed to flow on to the land from canals or kurriahos. The bulk of the wheat crops have in late years been raised on lands thrown up by the subsiding floods. When it is fit for the plough, it is ploughed over four times to the depth of about 9 inches; and it is during the fourth time that the seed is sown by being dropped through a wooden tube, fixed perpendicularly along the back of the plough, so that the grain falling the entire length of the tube issues from it at the point of the plough 9 inches below the surface of the ground. The

ploughing and the sowing is done by the same individual. For wheat cultivation soft alluvial clay land is always preferred, such as is left after the subsidence of the annual Indus inundations. Crops from sandy soil are not productive. Wheat on good soil generally grows to a height of 4 feet. The harvest takes place in February and March. The crop when reaped is collected in one spot on or near the field in which it has been reaped, specially cleared for the purpose. No threshing system is adopted. Treading out the grain by muzzled oxen is resorted to. The grain when extracted from the ear is piled up in heaps on the spot, and remains a short time till removed by traders. The sickle is used in reaping both by men and women. From 100 to 112·lbs. of seed is required to sow an acre. The system of sowing different kinds of grain in one and in the same field does not prevail. If there is mixture, it is not the result of intention. There is invariably an interval of nine to twelve months between the sowing of wheat and the crop immediately preceding it on the same ground, which preceding crop is sometimes wheat itself, but generally jowari, bajri, jamba or til.

The average wholesale price of wheat is Rs. 2-6 per maund.

Average consumption per head of the population is 120lbs. per head per annum.

Total consumption within the district is 50,000 maunds per annum.

Annual imports into the district for five years, and places whence imported.

	Mds.	
1872-73	2,000	Hyderabad district.
1873-74	2,000	
1874-75	2,000	
1875-76	2,000	
1876-77	2,000	

The above figures are all given approximately.

Annual exports for the same period, places whither exported, and proportion carried by road, rail or river.

	Mds.	
1872-73	80,000	Hyderabad district: a very small portion to the foreign States bordering on the eastern boundary.
1873-74	35,000	
1874-75	1,15,000	
1875-76	50,000	
1876-77	60,000	
Total ...	3,40,000	
Average of five years ...	68,000	

All by road, except about one-tenth by the Jhuda canal.

Estimated average cost of cartage to the railway station nearest the district.

Eleven annas per maund to Kotri (excluding one anna octroi dues at Gidu Bandar). This is not cartage but camel-hire.

Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river.

No direct trade with any port of shipment.

Local names of the varieties of wheat cultivated, and their description in English.

Thori (*No.* 1) is the finest wheat of the district; resembles "No. 1 white Bombay," a light, yellow, full grain, fine mellow and soft maida. The finest flour is produced from this wheat. From

16ozs. of this wheat 15ozs. of flour can be obtained, and 13ozs. of maida from the same quantity.

Kahahno (*No.* 2).—A long, bold, hard, brown grain, back of a lighter colour.

Goji gari (*No.* 3).—A soft, brown wheat, larger berried than No. 2.

Khudno (*No.* 4).—A light-brown, soft grain, smaller than No. 3, and full.

Goji jowali (*No.* 5).—The same grain as No. 3, but is so named from its being invariably mixed up with jao (barley).

General remarks.

The total area under wheat during the five years ending 1876-77 inclusive was 103,813 acres, and the average outturn per acre 600lbs. The total outturn during the same period was 7,78,597 maunds.

The import trade is comparatively insignificant, and is carried on by the same traders as are concerned in the export trade. These traders have been residents of the district for generations past. There are about twenty-five of these who are capitalists, the chief of whom exports about 5,000 maunds per annum, and the least about 500. The rest are petty traders. They are all Hindus of the Bania caste. Their trade transactions in wheat are confined almost wholly to the wholesale corn-dealers of the Hyderabad district, with whom they have no permanent dealing, transactions being renewed each year according to the outturn. No cultivation is carried on by them on their own account. The whole of the cultivation is in the hands of the Mahomedan ryots, from whom the traders buy up the grain after each harvest. This is the prevalent custom. All wheat for the ryot's own use is subsequently purchased at retail rates from local traders. There is no cleaning process before the wheat is delivered to the traders, nor do the traders clean the grain before exporting it. Mixture of different grains with wheat is not the result of intention on the part of the ryot, who never purposely sows different kinds of grain in one and the same field. Whatever mixture there is in the grain as it leaves the hands of the grower results from mixed seed sown; and this indicates indifference on the part of the sower. After the grain is received from the ryot, the traders store it up in their bandar (store-rooms), made of mud walls and cowdunged floors. All grain exported is delivered to the Hyderabad corn-dealers within two months after its delivery by the ryot. During transit to Hyderabad or elsewhere *on hired camels*, the wheat is placed in borees (gunny bags made up of goat's hair and sometimes of wool) and sewn up. As these borees belong to camelmen, they are eventually emptied out; and the wheat, if again further exported, is placed in borees belonging to the exporting traders. In this district the weevil commences its depredations three months after the grain is extracted from the ear; but the wheat can be preserved for seven months if it be shut up in pullees (large earthen jars) closed up. Seven months is the limit after which the weevil cannot be kept off by any means, except in the case of wheat kept for sowing, which is shut up in the pullees mixed up with ashes, when the weevil is kept off for a further period of two months only.

There are no agents of European merchants in this district.

No duties are levied in this district on the wheat trade.

Statement showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade in the Province of Sind.

Year.	District.	Total area under wheat.	Average outturn per acre.	Total outturn.	Imports.	Exports.	Remarks.
		Acres.	lbs.	Mds.	Mds.	Mds.	
1872-73	Kurrachee	29,344	600	2,20,080	Not ascertainable.		
	Hyderabad	22,172	807	2,23,660	2,84,730	1,42,416	
	Shikarpur	172,093	720	15,48,837	Not ascertainable.		
	Frontier, Upper Sind	35,136	393	1,72,605	55,960	77,584	
	Thar and Parkar	22,809	600	1,71,067	2,000	80,000	
	Total	281,554	.....	23,36,249	3,42,690	3,00,000	
1873-74	Kurrachee	27,212	600	2,04,090	Notascertainable.		
	Hyderabad	27,676	807	2,79,181	2,84,730	1,42,416	
	Shikarpur	150,700	720	13,56,300	Not ascertainable.		
	Frontier, Upper Sind	43,731	393	2,14,828	40,880	1,01,946	
	Thar and Parkar	12,982	600	97,365	2,000	35,000	
	Total	262,301	.....	21,51,764	3,27,610	2,79,362	
1874-75	Kurrachee	58,779	600	4,40,842	Not ascertainable.		
	Hyderabad	40,847	807	4,12,044	2,84,730	1,42,416	
	Shikarpur	215,458	720	19,9,3122	Not ascertainable.		
	Frontier, Upper Sind	84,749	393	4,16,320	45,950	3,68,203	
	Thar and Parkar	43,126	600	3,23,445	2,000	1,15,000	
	Total	442,959	.....	35,31,782	3,32,680	6,25,709	
1875-76	Kurrachee	28,624	600	2,14,680	Not ascertainable.		
	Hyderabad	30,507	807	3,07,739	2,84,730	1,42,416	
	Shikarpur	185,942	720	16,73,478	Not ascertainable.		
	Frontier, Upper Sind	58,564	393	2,87,695	49,000	3,23,332	
	Thar and Parkar	11,896	600	89,220	2,000	50,000	
	Total	315,533	.....	25,72,812	3,35,730	5,15,748	
1876-77	Kurrachee	50,837	600	3,81,277	Not ascertainable.		
	Hyderabad	34,418	807	3,47,191	2,84,730	1,42,416	
	Shikarpur	224,475	720	20,20,275	Not ascertainable.		
	Frontier, Upper Sind	76,470	393	3,75,658	35,900	2,08,801	
	Thar and Parkar	13,000	600	97,500	2,000	60,000	
	Total	399,200	.....	32,21,901	3,22,630	4,11,217	
	GRAND TOTAL	1,701,547	.....	1,38,14,508	16,61,340	21,32,036	

General Summary.

District.	Year.	Total area under wheat.	Total out turn.	Import.	Export.
		Acres.	Mds.	Mds.	Mds.
Kurrachee ...	1872-73 ...	29,344	2,20,080	...	...
	1873-74 ...	27,212	2,04,090	...	...
	1874-75 ...	58,779	4,40,842	...	...
	1875-76 ...	28,624	2,14,680	...	...
	1876-77 ...	50,837	3,81,277	...	...
	Total ...	194,796	14,60,969	...	...
Hyderabad ...	1872-73 ...	22,172	2,23,660	2,84,730	1,42,416
	1873-74 ...	27,676	2,79,181	2,84,730	1,42,416
	1874-75 ...	40,847	4,12,044	2,84,730	1,42,416
	1875-76 ...	30,507	3,07,739	2,84,730	1,42,416
	1876-77 ...	34,418	3,47,191	2,84,730	1,42,416
	Total ...	155,620	15,69,815	1,423,650	7,12,080
Shikarpur ...	1872-73 ...	172,093	15,48,837	...	...
	1873-74 ...	150,700	13,56,300	...	...
	1874-75 ...	215,458	19,39,122	...	...
	1875-76 ...	185,942	16,73,473	...	...
	1876-77 ...	224,475	20,20,275	...	...
	Total ...	948,668	85,38,012	...	...
Frontier, Upper Sind	1872-73 ...	35,136	1,72,605	55,960	77,584
	1873-74 ...	43,731	2,14,828	40,880	1,01,946
	1874-75 ...	84,749	4,16,329	45,950	3,68,293
	1875-76 ...	58,564	2,87,695	49,000	3,23,332
	1876-77 ...	76,470	3,75,658	35,900	2,08,801
	Total ...	298,650	14,67,115	2,27,690	10,79,956
Thar and Parkar...	1872-73 ...	22,809	1,71,067	2,000	80,000
	1873-74 ...	12,982	97,365	2,000	35,000
	1874-75 ...	43,126	3,23,445	2,000	1,15,000
	1875-76 ...	11,896	89,220	2,000	50,000
	1876-77 ...	13,000	97,500	2,000	60,000
	Total ...	103,813	7,78,597	10,000	3,40,000
	Grand Total	1,701,547	1,38,14,508	16,61,340	21,32,036

General abstract of wheat cultivation in Sind from 1872-73 to 1876-77.

Year.	District.	Total area under wheat.	Total outturn.	Imports.	Exports.	Remarks.
		Acres.	Mds.	Mds.	Mds.	
1872-73 to 1876-77.	Kurrachee	194,796	14,60,969	Not ascertainable.		
	Hyderabad	155,620	15,69,815	14,23,650	7,12,080	
	Shikarpur	948,668	85,38,012	Not ascertainable.		
	Frontier, Upper Sind	298,650	14,67,115	2,27,690	10,79,956	
	Thar and Parkar	103,813	7,78,597	10,000	3,40,000	
	TOTAL ...	1,701,547	1,38,14,508	16,61,340	21,32,036	

No. 74A., dated Ajmere, the 22nd October 1877.

From—A. C. LYALL, Esq., Officiating Chief Commissioner of Ajmere and Merwara,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to paragraph 5 of Government Resolution No. 1-49, dated 14th March last, regarding the adoption of measures for improving the quality of Indian wheat, I have the honour to transmit copy of a letter from the Commissioner of Ajmere, No. 1294, dated 12th instant, which supplies the required information.

2. The samples of wheat referred to in paragraph 3 of the Commissioner's letter are forwarded under a separate cover.

No. 1294, dated Ajmere, the 12th September 1877.

From—L. S. SAUNDERS, Esq., Commissioner of Ajmere,

To—The Officiating Chief Commissioner of Ajmere and Merwara.

With reference to your endorsement No. 200, dated 2nd April 1877, forwarding for report printed copies of correspondence on the subject of the adoption of measures for improving the quality of Indian wheat, I have the honour to forward a statement showing all the information called for in paragraph 5 of the Resolution of the Government of India.

2. The information has been given in a tabulated form, as I have found this to be the most convenient way of showing the details asked for.

3. Eight samples of wheat are forwarded under a separate cover. These have been put up in bags (each containing two pounds), and properly labelled with the name of the district in which the wheat was grown and its distinctive name.

Return of wheat grown in Ajmere and Merwara, called for by Government of India in Resolution dated March 1877.

Name of district in which wheat is grown.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.					Average outturn (in pounds) per acre.	A brief account of the cultivation, in which should be stated the kind of land preferred, the quantity of seed sown per acre, the crop which wheat follows, the season of cultivation, and other useful particulars.
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.		
(1)	(2)					(3)	(4)
						lbs.	
Ajmere ...	8,572	8,735	8,105	8,974	9,702	600	(a) *Brief account of the cultivation, &c.*—The land is ploughed at least six to eight times; but when any other crop has been sown during the rainy season, the land in which wheat is to be sown is ploughed from ten to fifteen times at intervals; the land is then levelled by a wooden instrument called "sanwar," which is used in place of a roller. The land is allowed to remain fallow till the sowing time, when it is again ploughed, and the seed is sown by means of a bamboo funnel (nacla) fixed to the plough's tail. After the field has been sown, it is again levelled. First watering is given after ten or fifteen days, and in all the fields are irrigated from two to six times. It chiefly depends on the winter rains. If showers in January or February generally fall, and if sufficient, it obviates the necessity of one or perhaps two waterings. By the winter rain the outturn is also often increased by 15 to 30 per cent. The crop ripens in February and March, and it is cut and gathered in March and April. Threshing commences in May; and by the end of that month it is over. Wheat is seldom or never sown broadcast. The lands are manured once in every three years, and the quantity of manure deposited is calculated from 200 to 350 maunds. Black soil known as "mutyar" and irrigable from wells is preferred to any other; and the slightly brackish water, which is plentiful, produces the best wheat. Wheat is seldom sown in poor unirrigated lands, as the produce, as a rule, seldom returns little more than the seed sown. Wheat is also to some extent sown with barley.
Merwara ...	2,379	Figures not available ...		5,466	6,527	560	(b) *Quantity of seed sown per acre.*—In irrigated lands about 150lbs. are sown, and in unirrigated from 70 to 128 lbs.
							(c) *Crops which wheat follows.*—The crops which wheat follows are Indian-corn, cotton and other rainy season crops; but in some instances lands are kept solely for wheat cultivation, and the outturn of these lands is much more than that in which some other crops has been sown before.
							(d) *Season of cultivation.*—October and November.

Return of wheat grown in Ajmere and Merwara, called for by Government of India in Resolution dated March 1877—*continued.*

Name of district in which wheat is grown.	Average wholesale price of wheat.		Average consumption per head of the population of the district.		Total consumption within the district in 1876-77.	Annual imports into the district for five years, and places whence imported.					
			One-third population.	Average consumption.		1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Places whence imported.
(1)	(5)		(6)		(7)	(8)					
Ajmere ...	Kathia baja.	S. C. 15 8	lbs. 103,304	lbs. 70	lbs. 7,231,280	lbs. 3,692,560	lbs. 4,278,160	lbs. 4,668,400	lbs. 4,954,040	lbs. 6,054,188	Principally from Marwar and Sheikawati.
	Kathia safed.	S. C. 14 4									
	Kathia suruk.	S. C. 13 8									
	Baja sajwa.	S. C. 16 8									
	Baja medgi.	S. C. 16 0									
	Baja wheat.	S. C. 15 10									
	Years.	1872-73									
		1873-74									
		1874-75									
		1875-76									
		1876-77									
Merwara ...	Kathia wheat.	S. C. 14 11	28,805	70	2,016,350	902,000	1,353,000	1,476,000	1,924,294	2,337,000	Principally from Marwar.
	Baja wheat.	S. C. 15 0									
	Years.	1872-73									
		1873-74									
		1874-75									
		1875-76									
		1876-77									

Note.—(1) The three kinds of kathia wheat are not grown in Ajmere, but imported from Merwara.
(2) Wheat is not the ordinary food of the population; so the consumption has been calculated on one-third only.

Return of wheat grown in Ajmere and Merwara, called for by Government of India in Resolution dated March 1877—*continued.*

Name of district in which wheat is grown.	Annual exports for the same period, places whither exported, and proportion carried by rail, road or river.						Estimated average cost of cartage to the railway station nearest the district.	Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river.
	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Places whither exported and proportion carried by rail, road or river.		
(1)	(9)						(10)	(11)
	lbs.	lbs.	lbs.	lbs.	lbs.			
Ajmere ...	Wheat is not exported from Ajmere ...					Not exported beyond the district ...		Cost of transit of 100 maunds of wheat by rail to Bombay is Rs. 175-0-8; Calcutta, Rs. 125-3.
Merwara ...	Wheat is not exported from Ajmere ...					Not exported beyond the district ...		Cost of transit of 100 maunds of wheat by rail to Bombay is Rs. 175-0-8; Calcutta, Rs. 125-3.

Return of wheat grown in Ajmere and Merwara, called for by Government of India in Resolution dated March 1877—*concluded.*

Name of district in which wheat is grown.	Local names for the varieties of wheat cultivated, and their description in English.	A general summary for the province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the imports and exports.					
		Total area under wheat.	Average outturn per acre.	Total outturn during 1876-77.	Imports, 1876-77.	Exports.	Remarks.
(1)	(12)	Acres.	lbs.	lbs.	(13) lbs.	lbs.	
Ajmere	Baja kharcha ... This is a fine, red wheat, and is produced by brackish water. Baja medgi ... This wheat is of second quality, and flour is chiefly made from it. Baja sajwa ... This wheat is an admixture of barley; specimens submitted.	9,702	600	5,821,200	6,054,188	*Nil*	The wheat grown here is said to be of very good description, especially that of the village of Kanpura and other villages in its neighbourhood, which are reported to produce excellent white wheat.
Merwara	Kharcha baja ... See above ... ... Medgi baja ... Ditto ... ... Kathia safed ... White wheat ... ... Kathia suruk ... Red wheat ... ... Kathia baja ... Admixture of kathia and baja wheat: specimens submitted.	6,527	560	3,655,120	2,337,000	*Nil*	

L. S. SAUNDERS,
Commissioner of Ajmere.

No. 2140A., dated Naini Tal, the 22nd July 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to Resolution No. 1-42, dated the 14th March 1877, I am directed to submit, for the information of His Excellency the Governor General in Council, twenty copies of a report* by the late Officiating Director of Agriculture and Commerce, North-Western Provinces and Oudh, on wheat cultivation in these Provinces.

* No. T.—453A., dated the 28th June 1878.

No. T.—453A., dated Allahabad, the 28th June 1878.

From—F. N. WRIGHT, Esq., Offg. Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government, North-Western Provinces and Oudh.

I have the honour to submit the report regarding wheat cultivation in the North-Western Provinces and Oudh called for in Government of India Resolution No. 1-42, dated 14th March 1877, received under your endorsement No. 466A., dated 24th March 1877.

2. The delay in the submission of the report has been owing to the difficulty of getting in the information from district officers, and the subsequent analysis and collation of the large mass of statistics forwarded by them. I am unable to state that the information now obtained is as complete or as satisfactory as I could wish; but I am unwilling to defer the submission of the report any longer, premising only that, if the present be accepted as a preliminary report, I shall be in a better position to supply accurate statistics as to the area under wheat, its consumption, its export and import, in the course of a year or two, when the system of preparing the village statements, only recently adopted, shall have been thoroughly established. I proceed then to summarise the information received from the various districts in the order in which the information is tabulated in the Government Resolution.†

3. Wheat is grown in every district in the North-Western Provinces and Oudh in varying proportions, according to the quality of soil found within each district. It is scarcely necessary to notice the vastly different physical characteristics of the several divisions comprised in this wide area, except as far as they bear on the extent of wheat cultivation, and consequently on the wheat supply for export. Thus we have the mountainous division of Kumaun, the isolated tract of the Dun, the *Antarbed* or Doab of the rivers Ganges and Jumna, in which principally lie the divisions of Meerut, Agra and Allahabad, the trans-Gangetic divisions of Rohilkhand, of Oudh and of Benares, and the trans-Jumna districts of Bandelkhand and the Jhansi Commission.

The wheat-growing tracts of North-Western Provinces and Oudh.

† No returns have been received from Kumaun and Garhwal districts.

4. This is not the place to minutely describe the several characteristics of so many and varied tracts; but it is evident that there must be a wide difference in the proportionate area under wheat, its cultivation, and its outturn between the moist alluvial soils of the North-West, the mountainous or semi-mountainous tracts of Kumaun and the Dun, and the dry-land soils of the trans-Jumna country. Thus I find that in the Dun, out of 82,248 acres cultivated, only 14,222 acres are under wheat; in Bandelkhand again the area sown with unmixed wheat is trifling compared to that under wheat mixed with other grains; whilst in the rich tracts of Rohilkhand and the Doab the cultivation of wheat has reached the proportion of 22·25 and 20·47 per cent. respectively of the cultivated area, and is rapidly increasing.

Admixture of other crops with wheat.

5. It may be advisable to note in this place that, as the Government of India have directed our attention principally to procuring information about wheat, and that with the view of encouraging the cultivation of pure unmixed wheat for export, the remainder of this report treats of wheat unmixed only. Wheat, it is true, is grown either mixed with barley, when the mixture is known as "gojai," or with gram and peas, when it is known as "gochanna" or "birra." The precise object of the cultivator in growing mixed crops has long been a matter in dispute—whether, that is, he expects a larger outturn, or a crop more in demand for local consumption, or, as I myself think, he does it to forestall any accident of season. Wheat is a crop highly sensitive to the variations of the weather. Parched by the frost, or liable to rust from excessive moisture as wheat is, the hardier barley or gram may help the cultivator through the season when an unmixed crop of wheat might have ruined him altogether. Be that as it may, what is wanted is a pure unmixed wheat, and the cultivation of that alone is to be encouraged; and the prejudice, or whatever the motive is, of the cultivator concerns us only so far as its adoption to a greater or less extent in any given tract affords an indication of the possible supply from that tract of the unmixed grain. Thus we find that, whilst in the richer soils of the northern divisions wheat unmixed, or in which at least only rape is grown, forms the chief proportion of the crop, in the lighter soils across the Jumna, or I may even say the Sengar, gojai (wheat and barley) and birra (wheat and pulse) are principally grown, and chiefly on unirrigated lands.* The effect of this variation in soil on the *class* of wheat grown will be noted in a subsequent paragraph.

* Banda report says: "Wheat is probably not grown alone in more than one per cent. of the total area, and not more than two per cent. of the rabi area. Wheat and gram, on the other hand, are grown in about one-third of the total area, and form the bulk of the rabi crop."

Area under wheat.

6. It has been found impossible to give complete statistics as to the area under wheat in each of the last five years to the end of 1876-77. The complete registration of crop statistics has only recently, and as yet only partially, been established in the North-Western Provinces; and in Oudh the agency that the North-Western Provinces possesses in its supervising kanungos for the collection of such statistics is not forthcoming. The area given in the settlement papers is not that of one year for a whole

district, but the accumulated area of each pargana as it came under settlement. Again, were the statistics for five years obtainable, they are on the face of them so untrustworthy, that they have been rejected even by the officers submitting them. Whilst one cannot but feel convinced that—owing to the conclusion of settlement operations (during which it is the landlord's interest to encourage the cultivation of inferior crops, and thereby depreciate the value of the land in the settlement officer's estimation), and the immense stimulus to the cultivation of wheat which has ensued from the rapidly-increasing export trade, not even taking into account the spread of cultivation and irrigation—the area under wheat must have extended largely during this period, the figures compiled in the local offices would tend to prove a diminution in the cultivation—a conclusion which no one would be prepared to accept without the most complete and satisfactory evidence (such as we have not yet) before him.

7. The total area under wheat in the North-Western Provinces and Oudh, exclusive of Kumaun* and Garhwal, during the year 1876-77 amounted to 5,902,770 acres, distributed as follows by divisions:—

	Acres.
Kumaun (Terai)	27,187
Meerut	1,371,103
Agra	671,461
Rohilkhand	976,587
Allahabad	323,502
Benares	511,176
Jhansi	116,956
Oudh	1,904,798
Total ...	5,902,770

Or, again, according to geographical divisions—

Dehra Dun	14,222
The Ganges-Jumna Doab	2,257,344
Ganges-Gogra Doab	2,695,730
Trans-Gogra	659,452
Trans-Jumna (including Mirzapur) ...	276,022
Total ...	5,902,770

8. With respect to the estimated outturn in pounds per acre, I must plead *quot homines, tot sententiæ*. There is, as you are well aware, a tendency to dogmatise on such points, and the exponent of any one view is too apt to close his ears to all the arguments of the other side, and to ignore any possible elements of differentiation which may make the statements of both parties correct as far as their own data go. Thus in some districts wheat is grown only on the very best land—that nearest the homestead—and is thoroughly (according to the native standard) manured and

Outturn per acre.

* The Kumaun area has since been received, which is as follows:—

	Acres.
Kumaun	141,750
Garhwal	36,887

irrigated. Such is the case in the more northern districts, where a dense population necessitates and ensures high cultivation, and the extension of canal irrigation gives a security to the cultivation of this crop which is wanting elsewhere. In the khadir (or alluvial) lands of the large rivers natural moisture supplies the place of artificial irrigation; and, again, in the black soils of the trans-Jumna districts the intrinsic fertility of the soil is so great, that (given opportune rains, without which successful ploughing is impossible) a high outturn is obtained without manure or irrigation, and with the minimum of preparation by ploughing.

9. At the same time it may be safely laid down as an axiom that the cultivation of wheat is high-class cultivation. In most districts it is limited to the best land, by the manure supply and by facilities for irrigation: where these last two factors are wanting, it is still confined to the best land only. It is not, like mixed wheat and mixed barley crops, grown on any land, and the outturn of which varies from almost *nil* to a reasonably prolific crop; and it should not therefore be difficult to lay down certain fixed boundaries within which the probable average outturn will certainly be found. The data submitted by district officers give an outturn varying from 408lbs. to 1,440lbs. per acre. It is evident on the face of it that so wide a variation cannot be accepted as a basis for any satisfactory estimate of the probable outturn for any given year, or to even tract of country.

10. I will here quote the *ipsissima verba* of two Commissioners, who have carefully analysed the information obtained by the district officers under them. Mr. Capper, Commissioner of Fyzabad Division, says: "The highest outturn recorded for England is 1,800lbs. average, and of late years the average in Mark Lane estimates has been 1,680lbs. to 1,340lbs. Arthur Young records that the average for all England during a series of years is 1,380lbs.; and I certainly do not believe that the average here will be nearly as high as that in England. In the *Ain-i-Akbari* it is estimated at 1,143lbs.; but the different reports at hand give—

	lbs.
Saharanpur and Muzaffarnagar ...	1,080
Bareilly	1,046
Hoshiarpur District	922
Hoshiarpur English Farm	634
Mr. Montgomery's Report ...	836
Punjab Revenue Report	758
Mr. Thornton's Report	700
Lahore Revised Settlement ...	510
Mr. Melville's Report	444

"If on these an average be struck for what it may be worth, it would be 770lbs. per acre, or near the Fyzabad return. I am certain that the Gonda outturn (1,312lbs.) can only be obtained under very exceptional circumstances on but a small area of exceptional land.

Bahraich gives it as 553lbs. only per acre, and on a reference adheres to this calculation. I am not prepared to say that these figures are very wrong; for much of the soil is newly broken up, and cultivation is generally slovenly, and labour scarce." In fact, Mr. Capper would consider 800lbs. a very fair average outturn. On the other hand, Mr. Elliott Colvin, Officiating Commissioner of the Meerut Division, writes as follows: "The Collector of Saharanpur puts the outturn of wheat per acre at an average of 456lbs., and gives an average harvest rate of about 50lbs. per rupee. Now, rent for wheat lands will be Rs. 4, and water-rate Rs. 2 per acre. Therefore, to obtain these sums, 300lbs. of produce must be sold, and 80lbs. are required to replace the seed sown. To meet good profit and working expenses, the margin of 76lbs. remains; and this small margin is still sufficient to cause 214,745 to 267,332 acres to be sown with wheat. The area is probably correct enough; but the outturn is absurd. Mr. Powell, a planter, in a memorandum which shows more knowledge of the subject, puts the outturn between 221 and 1,160 lbs. The Meerut Collector sends a memorandum by Mr. Webbs, a zamindar, which shows practical knowledge. He would put wheat outturn at 1,080."

11. He adds also that he would prefer to accept the estimate made by Mr. Smith, Settlement Officer of Aligarh, of 1,414lbs. to the acre, rather than a reduced estimate submitted by the Collector of 900lbs.

12. And yet for an *average* outturn, I should be inclined myself rather to accept even something below the latter estimate. In a memorandum on the agriculture in the district of Cawnpore which I had the honour to draw up I estimated the outturn of wheat as follows: "8 maunds (656lbs.) for dry lands, 16 maunds (1,312lbs.) for the best sorts sown in the best land." Now I have frequently seen as much as 1,640lbs. (or over 26 bushels) per acre growing in good rich land; and as the cultivation of wheat is chiefly confined, as I have said, to the best land procurable (though recently the extension of canal-irrigation and increased demand for produce has led to its cultivation on inferior soils), a fairly high average may be looked for in districts where conditions for high cultivation are favourable. But I have myself seen nothing, and there is nothing in the reports now before me to warrant so high an *average* being taken as 1,414lbs. On the other hand, the peculiar characteristics of cultivation in the trans-Jumna districts forbids an estimate of average outturn being accepted above 600.

13. To sum up: with all deference, I submit it as my opinion that for the districts north of the Jumna 750lbs., and for the districts south of the Jumna 600lbs., may be accepted as a fair estimate of the average outturn per acre of unmixed wheat; and a general average of 700lbs may be assumed for the whole province.*

* *Note.*—How grievously such calculations are liable to error is, however, shown by the result of the harvest of 1877-78. With every prospect of a magnificent crop up to February, the peculiar atmospheric condition of the early portion of that month utterly ruined the crop, which in harvesting was found to be light beyond belief, and to consist of a wretched shrivelled grain, which in one experiment only yielded 6lbs. of a full round *berry* to 82lbs. of grain. The chaff, roughly speaking, is double the weight of grain.

The following are the figures derived from the detailed reports :—

Names of divisions.	Average outturn per acre.	
	lbs.	Bushels.
Meerut Division	640	10·66
Agra Division	847	14·11
Rohilkhand Division	695	11·58
Allahabad Division	747	12·55
Terai Division	530	8·83
Benares Division	713	11·88
Jhansi Division	610	10·01
Oudh Division	866	14·43

Or again—

Names of geographical divisions.	Average outtnrn per acre.	
	lbs.	Bushels.
Dehra Dun	410	6·8
Ganges-Jumna Doab	779	12·98
Ganges-Gogra Doab	762	12·70
Trans-Gogra	926	15·43
Trans-Jumna	587	9·78

Cultivation.

14. The method of cultivation throughout the North-Western Provinces and Oudh varies little; it is only in the dry trans-Jumna tracts that any difference in method exists from that adopted in the more northern districts.

Soil.

As I have above remarked, the land selected is almost universally the best obtainable. That nearest the homestead, enriched from the habits of the country by adventitious manure, and also more frequently fertilised with the scanty accumulations of ashes, sweepings, refuse straw and the dung of the plough-cattle (collected only in the rainy months), which form the cultivator's only manure supply, is most highly prized. Here irrigation is almost always obtainable; where it is not, the manure is hauled out to the best land procurable, irrigated if possible. The extension of canal irrigation has led to a wider cultivation of wheat without a corresponding increase in the manure supply; but where a canal-irrigating channel passes through only one portion of a village, there will be found the highest cultivation and the best crops.

15. The amount of manure thrown on the land rarely, if ever, exceeds four tons, and is more often only two tons to the acre. Under the present wasteful system of conservation of manure, a cultivator can scarcely ever collect more than enough for one-sixth of his holding. This he naturally devotes to his best crop. He does not, however, generally manure directly for wheat, but for the crop of the preceding year, cotton or sugarcane: the virtue of this manure remains unexhausted sufficiently for the wheat crop. It is not unusual to take a crop of maize off the land where it is very richly manured, as in the immediate neighbourhood of villages. The second crop, however, suffers proportionately. This system is known as "dosahi" or "dofasli."

Manure.

16. Strict rotation of crops is not recognised. The cultivator alternates his rain millets and his spring cereals year after year; but as cotton is largely grown in the best land only, it is followed by wheat in the majority of instances.

Rotation of crops.

17. If no crop precedes wheat in the same year, the cultivator will plough his land as often as he has the opportunity after he is free from sowing and weeding his rain crops. The number of ploughings given by district officers varies from four to fourteen. It may be accepted that the cultivator ploughs as often as he can when the ground is open and firm. In the black soils of Bandelkhand it is impossible, from the tenacious character of the soil, to plough during the rains; and if the rains cease early, the soil becomes too hard to plough. Hence successful cultivation of wheat depends in these districts on the rains being perfectly opportune. Again in the alluvial soils of the great rivers a very limited number of ploughings is sufficient to ensure thorough fertility. After ploughing, the clods are crushed, the surface levelled by a heavy board (patha, pateli) being dragged over it. The use of the harrow, properly so-called, is unknown. In lands infested with the kans (*saccharum spontaneum*) grass in Bandelkhand the "bakhar" is used to eradicate the deeply-set roots of this destructive weed. The bakhar has an iron scythe, 20 inches broad and 5 inches deep, fixed to the centre of a beam of wood, which enters into the ground about 8 inches, eradicating weeds and grass, and the beam pulverising the earth as it is turned up.—(*H. Elliott.*)

Season of cultivation.

18. Sowing commences after 15th October, and is carried on till late in November. Wheat is, however, always sown after the other crops, and practically it may be generally assumed that the first or second week in November sees the wheat crop in the ground. The seed is usually sown in drills, being passed down a bamboo or wattle tube fastened to the plough.

Sowing.

19. The amount of seed sown per acre as given by the district officers varies from 58 (Saharanpur) to 188 lbs. (Sitapur). In soils like black soil (mar) they record that a large amount of seed is sown, as it is more liable to rot; but I cannot accept so wide a variation in the amount of seed usually sown where no marked difference of soil or method of agriculture is shown to

Seed.

exist. I believe 100 lbs. of seed per acre to be a fair estimate of the average amount of seed sown, and the following statement fairly confirms my estimate :—

Name of geographical division.	Average quantity of seed sown per acre.		Remarks.
	lbs.	Bushels.	
Kumaun (Terai) and the Dun.	74	1·23	As the usual minimum of wheat sown per acre in England is two bushels, the fault of excessively thick sowing can be hardly held to apply to cultivation of wheat in the North-Western Provinces.
Ganges-Jumna Doab	101	1·68	
Ganges-Gogra Doab ...	116	1·93	
Trans-Gogra ...	126	2·10	
Trans-Jumna ...	110	1·83	

Intermediate operations.

20. Wheat is not often weeded; pot herbs which spring up amongst it are picked out by hand, but systematic weeding is neither known nor necessary. The number of times wheat is irrigated depends on the season and the opportuneness or otherwise of the winter rains. It may be accepted that where irrigation is possible wheat is irrigated. In the Bandelkhand districts and low alluvial tracts it is not irrigated, in both instances the presence of sufficient natural moisture rendering the construction of wells unnecessary.

21. The first watering is given when the young plants are 4 inches high; the last as the berry begins to swell. If the winter rains are good, then two waterings suffice; otherwise three, or even four, waterings are given.

Harvest.

22. The crop ripens towards the end of March, and is cut from the end of March to the middle of April. Later in the more northern districts than in the Benares division, where the harvest commences at least a fortnight earlier than in Aligarh and upwards. The crop, being cut generally by labour paid in kind (one sheaf in twenty being given to the reapers), is carried to the threshing-floor, where it is trodden out by bullocks, and the grain is sifted from the chaff by the action of the wind. The uncleaned stuff being poured from a basket held up in the air, the heavy grain falls at the feet of the operator; the chaff is blown a short distance off. Where the wind is naturally insufficient, the artificial agency of a blanket or cloth is resorted to. A thorough separation of grain chaff cannot be expected from the simple process, but the degree of cleanness which is obtained is remarkable.

23. Where mustard has been grown in the same field, it is gathered by hand before the wheat is cut. Hence there is, or should be, little or no admixture of rape in the wheat as it reaches the market.

Prices.

24. The average wholesale price of wheat cannot be given with any approach to accuracy. It varies according to season, and any arbitrary assertion on this point would be unjustifiable and misleading. It may be generally observed that where wheat was selling for 64lbs. per rupee a few years ago, in 1877 it was fairly steady at about 40lbs. per rupee; whilst it has risen in 1878 to 28 and 30 lbs. An average rate of 40lbs. per rupee would pay the cultivator, the collecting agents, and the exporter well. Present rates do not pay the exporter. Competition is so keen, and the margin of profit so narrow, that practically present prices are prohibitive.

Local consumption.

25. Wheat is not the food of the masses. They live either on the millets of the autumn crops or the coarse mixed grains (barley, gram and peas) of the spring harvest. The urban population undoubtedly do consume a large proportion of wheat for their numbers; and the richer proprietors or tradesmen in the villages also use wheaten flour. But to the millions wheaten flour is a luxury, untasted perhaps from birth to death, or only at high festivals and holidays. Hence any calculation of local consumption is unanimously declared by district officers to be utterly untrustworthy and misleading.

Varieties of wheat.

26. The local names of the varieties of wheat grown are most numerous. In collecting samples for the Government of India, in accordance with th einstructions contained in paragraph 6 of Resolution No.—, 220 specimens were received. Many of these, however, appear to be varieties of the same kind, bearing different names in different localities: on the other hand, the same name is borne by different varieties in different districts.

27. To clear up all this confusion in names, Mr. Buck, after sending the first instalment of samples to the Government of India, had the remaining portion of the samples examined by experts at Allahabad and Cawnpore. They divided them into 44 classes, according to their merits; and under each class were arranged those that were alike and which should probably be classed as one variety. A description of each class of wheat, thus arranged, has been given by the experts, which will be found in Appendix C to this report.

28. From the incomplete and unscientific descriptions of the various kinds of wheat given by district officers, the following broad classification has been formulated, and may be accepted as approximately correct.

29. The primary division is into white and red wheats, a subordinate division being made into bearded and unbearded wheats. The white wheats have a fuller berry and a softer husk, the red wheats a long narrow berry with hard husk.

30. The outturn of the white varieties is larger; on the other hand, the red varieties are hardier, and grow on unirrigated lands.

31. Generally speaking, the flour of the red varieties is preferred by the people, the whiter varieties being grown for export.

32. The most universally recognised varieties of white wheat are the—

Mandia (muria), a beardless plant.

Seta, Safed, Ratua, Dudhia or Daudi } (synonymous), bearded.

Pisiya, the variety best known in the districts bordering the Jumna on either side.

33. Of the red wheats, the varieties most known are the—

Lalia or lal.

Kathia, principally grown in the districts bordering the Jumna on either side.

34. A mixed red and white class is called gajar or gajra.

35. The remaining names in Appendix C are merely local synonyms for the above, or are sub-varieties of the principal species. In some few instances imported varieties are grown, but these have as yet no footing in the country.

36. Roughly speaking from the returns before me, the total area under wheat (unmixed with barley or pulses) in 1876-77 amounted to 6 millions of acres, of which on the scale I adopted in paragraph 13, *i.e.*, 700 lbs. per acre for the whole province, the approximate outturn would equal 70 millions of bushels, or (for carriage) 1,875,000 tons.

37. At an outside estimate, only one-tenth of the total population in the North-Western Provinces and Oudh consumes the flour of unmixed wheat as daily food; and 1½lbs. per diem would be a liberal allowance for each individual. We have then—

Total population of North-Western Provinces and Oudh in 1876-77—	
Census of 1872 + one per cent. each year since ...	43,634,042
One-tenth of above	4,363,404
Total yearly consumption at 1½lbs. per head per diem	1,066,500 tons.
Remaining for export	808,500 „

38. The annual imports and exports cannot be given with accuracy. Local trade has not yet been accurately registered. As far as ascertainable, it is given in Appendix A. The export by rail on the East Indian Railway is also given, and it is an indication of the growth of trade when in 1876—

Cawnpore exported	...	...	55,685 tons.
Etawah	„ ...	...	11,005 „
Aligarh	„ ...	...	5,416 „
Agra	„ ...	...	2,267 „

39. The disposal of the produce of the North-Western Provinces and Oudh, together with the quantity imported, may therefore be shown as follows:—

	Tons.		Tons.
Estimated produce of North-Western Provinces and Oudh in 1876-77.	1,875,000	Consumption in North-Western Provinces and Oudh.	1,066,500
		Exported to Punjab ...	22,394
Imported from Punjab ...	9,566	„ „ Native States ...	12,376
„ „ Native States	3,041	„ „ Central Provinces.	178
„ „ Central Provinces.	769	„ „ Bombay (G. I. P. Railway).	23,966
„ „ Bombay ...	...	„ „ Bengal ...	160,326
„ „ Bengal ...	737	„ „ Nepal ...	36
„ „ Nepal ...	330	Stock in hand ...	603,667
Total ...	1,889,443	Total ...	1,889,443

40. The wheat trade with Europe is continually increasing; and to develop it still further endeavours are being made by this department to impress upon the cultivators the necessity of producing the best kind of white wheats, and keeping the wheat from being mixed with other kinds of grains. And as the classes of wheat now exported from these Provinces are universally valued below those of the Central Provinces (Sohagpur, Hoshangabad, &c.), attempts have also been made to introduce the latter varieties, but as yet with no great success. The quantity of the North-Western Provinces wheat that actually found its way during 1876-77 to the United Kingdom and the Continent cannot be given, as the grain is collected at the ports of Calcutta and Bombay, and it is there shipped with grain obtained from other provinces. Besides Bombay and Calcutta, the North-Western Provinces wheat has found another outlet. Being collected at Delhi and other Punjab marts, it is carried by rail to the Indus, and is thence taken down by river to Kurrachee, from which port it is shipped for Europe.

41. Although actual figures for the quantity of wheat exported from the North-Western Provinces to Europe cannot be given, it undoubtedly represents a large portion of the annual exports during the last few years, which was continually on the increase up to the present year. The increase in the export of wheat from British India is brought clearly out in the following figures obtained from the journal of the Royal Agricultural Society:—

1874	1,076,876	cwts.
1875	1,334,943	„
1876	3,279,887	„
1877	6,104,940	„

being one-ninth of the total amount of wheat imported into England. In 1878 the amount will have fallen off greatly, owing to the prohibitive prices to which I have above referred; but that a permanent wheat

trade is established between India and England needs no further proof.

42. Messrs. Hoare, Miller & Co., a grain-exporting firm of Calcutta, has furnished me with the following description of the varieties of North-Western Provinces wheat valued for export to Europe.

Fine wheat.—This is at first collected at Delhi from the adjacent districts of the Punjab and the Meerut division. It is full flat grain, tender skin, and of milky, very soft substance. The Jubbulpore white wheat is still more white and bulky.

Fine red.—Sent to Calcutta chiefly from Meerut. It is very floury and white below the skin, and very soft.

Medium white.—From Agra and Etawah. This is a good bold bulky grain, but harder and of a darker colour than that from Delhi, and less pure, *i.e.*, more mixed with dark and reddish grains.

Medium red.—From the same centres, smaller in grain but floury and soft.

Cawnpore.—A medium-sized grain, mostly white, but a good deal mixed. In good order it is full and round and soft. It is smaller than the up-country sorts, but it is a very suitable description.

Gangajali.—This name now seems to be applied to all white or red sorts that are hard and dull and brittle. This is not liked.

43. Messrs. Hoare, Miller add that, "on the whole, Indian wheat has made an excellent impression on the English trade. But it suffers from the great drawback of impurity. The Punjab and the upper North-West wheat, which are the best in size and substance, are the most impure, being mixed with barley and pulses to an injurious extent." The above opinion is confirmed in a report by a firm in Bombay on some samples privately submitted from Budaun district.

44. In Cawnpore market the following are the classes of wheat quoted amongst the mercantile community :—

White wheat.—From Cawnpore, Etawah and Delhi, No. 1 club. This is identified as dudhia or daudi (*vide* paragraph 32).

Mixed wheat.—From the surrounding districts and Oudh, No. 2 club. This is the class known as gajar or gajra.

Red wheat.—From the surrounding districts and Oudh, No. 2 club. This is the well-known lalia or lal.

45. Three appendices have been added to this report.

Appendix A shows the information (as far as obtainable) required by Government of India, district by district.

Appendix B shows the price of wheat prevailing in different districts during the last five years.

Appendix C gives a list of the varieties of wheat of which samples have been sent to the Government of India, with a short description of each.

Appendix A.

Statement containing information regarding wheat (as far as obtainable), shown district by district.

Division.	District.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.		Average outturn (in lbs). per acre.	Average wholesale price of wheat as given by district officers.	Annual imports into the district for five years, and places whence imported.	Annual exports from the district for five years, places whither exported, and proportion carried by rail, road or river.	Estimated average cost of carriage to the railway station nearest to the district.	Cost of transit to the port of shipment, Calcutta, Bombay or Kurrachee, by rail, road, &c.
1	2	3		4	5	6	7	8	9
		Years.	Acres.		lbs. per rupee.			Rs. A. P.	Per 100 maunds=3·70 tons. Rs. A. P.
Upper Doab (Meerut Division).	Saharanpur...	1874-75 ...	214,745	456	49	34 tons from Bijnor and Moradabad by road.	1,214 tons to Bijnor and Moradabad by road.	2 6 3 per ton ...	184 2 8
		1875-76 ...	267,332						
		1876-77 ...	265,464						
	Muzaffarnagar	1876-77 ...	461,707	610	49	.....	21,106 tons to Rohilkhand.	3 6 0 „ ...	179 7 8
	Meerut ...	1876-77 ...	308,338	728	53	174 tons from Rohilkhand by road.	24,750 tons to Rohilkhand by road. 934 tons from Ghaziabad by East Indian Railway.	3 6 0 „ ...	174 12 8
	Bulandshahr	1876-77 ...	139,138	746	53	520 tons from Moradabad by road. Imports by rail, 77 tons.	768 tons to Moradabad by road. Exports by rail 1,204 tons.	1 11 0 „ ...	165 1 8 from Chola railway station.
	Aligarh ...	1876-77 ...	183,234	890	47	1,036 tons from Badaun and Etah by road.	4,127 tons to Budaun and Etah by road. Exports by East Indian Railway 5,416 tons.	Per ton. 0 6 9 Koil to Aligarh railway station. 2 8 6 Sikandra Rao to Hattras railway station. 0 13 6 Khair to Somna railway station. 2 1 9 Iglas to Hattras railway station.	Rs. A. P. From Aligarh ... 159 1 8 „ Hattras ... 156 1 8 „ Somna ... 161 1 8
Rohilkhand.	Bijnour ...	1876-77 ...	91,745	408	47	21,277 tons from Doab by road.	263 tons to Doab by road.	Per ton. Rs. A. P. From Bijnor to Khatauli. 5 1 0 From Moradabad to Muzaffarnagar. 5 1 0 From Najibabad to Muzaffarnagar 10 15 6 From Nagina to Moradabad. 6 12 0	Muzaffarnagar railway station. 179 7 8 Moradabad railway station *viâ* Lucknow. 153 1 8 Khatauli ... 177 14 8

Statement containing information regarding wheat (as far as obtainable), shown district by district—*contd.*

Division.	District.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.		Average outturn (in lbs.) per acre.	Average wholesale price of wheat as given by district officers.	Annual imports into the district for five years, and places whence imported.	Annual exports from the district for five years, places whither exported, and proportion carried by rail, road or river.	Estimated average cost of carriage to the railway station nearest to the district.	Cost of transit to the port of shipment, Calcutta, Bombay or Kurrachee, by rail, road, &c.
1	2	3		4	5	6	7	8	9
		Years.	Acres.		lbs. per rupee.			Rs. A. P.	Per 100 maunds=3·70 tons. Rs. A. P.
Rohilkhand—*contd.*	Moradabad...	...	205,746	784	48	7,755 tons from Doab by road.	338 tons to Daob by road.	2 8 6 per ton ...	153 1 8
	Bareilly ...	...	247,947	710	48	64 tons from Nepal and Kumaun by road.	346 tons to Nepal and Kumaun by road.	1 11 0 „ ...	146 1 8
	Budaun ...	...	229,452	648	53	.....	Wheat is exported to Hattras and to Bareilly by road, and to Cawnpore by boat.	2 1 9 „ ...	148 1 8 from Aonla station.
	Shahjahanpur	...	201,697	924	64	.....	.....	2 15 3 „ ...	141 1 8
	Terai ...	1872-73 ...	22,608	471	55	.....	.....		Rs. A. P. Bareilly, the nearest railway station. 146 1 8
		1873-74 ...	23,350	567					
		1874-75 ...	25,000	670					
		1875-76 ...	26,364	441					
		1876-77 ...	27,187	530					
Middle Doab (Agra Division).	Muttra ...	...	81,024	1,110	53	1,284 tons from Rajputana by road.	1,648 tons to Rajputana by road. Exports by rail 58 tons.	2 1 9 „ ...	160 4 4
	Agra ...	1871-72 ...	97,743	989	47	3,508 tons from Rajputana by road. Imports by rail 2,951 tons.	10,510 tons to Rajputana by road. Exports by rail 2,309 tons.	2 8 6 „ ...	149 1 8
		1872-73 ...	92,398						
		1873-74 ...	102,277						
		1874-75 ...	94,616						
		1875-76 ...	101,204						
	Farakhabad	...	136,815	710	49	6,583 tons from Hardoi and Sitapur by road.	667 tons to Hardoi and Sitapur by road.	5 14 6 „ ...	Shekohabad station ... 147 1 8
	Mainpuri ...	...	137,496	766	47	Imports by East Indian Railway 1,126 tons.	Exports by East Indian Railway 3,431 tons.	2 1 9 „ ...	Ditto ... 147 1
	Etawah ...	...	71,233	800	47	146 tons from Bandelkhand by road. Imports by rail 710 tons.	1,675 tons to Bandelkhand by road, Exports by rail 11,005 tons.	1 11 0 „ ...	141 1 8

Bandelkhand.	Etah ...	...	1,43,689	706	40	3,623 tons from Budaun by road.	2,708 tons to Budaun by road.	4 10 8	,, ...	From Shekohabad station	147 1 8
	Jalaun ...	...	3,330	649	58	808 tons from Bandelkhand by road.	194 tons to Bandelkhand by road.	7 9 6	,, ...	From Phaphund station	135 1 8
	Jhansi ...	...	49,643	560	47	980 tons from Bandelkhand by road.	47 tons to Bandelkhand by road.	11 13 0	,, ...	Ditto ditto ...	135 1 8
	Lalitpur ...	...	63,993	622	53	...	...		.....	Ditto ditto ...	135 1 8
	Banda ...	...	24,222	618	47	975 tons from Bandelkhand by road. Imports by East Indian Railway 88 tons.	829 tons to Bandelkhand by road. Exports by East Indian Railway 177 tons.	5 1 0	,, to Fatehpur railway station.	Fatehpur railway station	117 1 8
	Hamirpur ...	...	45,353	580	55	50 tons from Bandelkhand by road.	2,734 tons to Bandelkhand by road.	5 0 0	for one cart-load to Cawnpore railway station.	From Cawnpore ...	126 1 8
Lower Doab (Allahabad Dr.)	Cawnpore ...	...	81,773	742	44	67,076 tons from Oudh by road. Imports by rail 349 tons.	204 tons to Oudh by road. Exports by rail 55,685 tons.	3 6 0	per ton	126 1 8	
	Fatehpur ...	1872-73 ...	81,809	774	40	2,332 tons from Rai Bareli by road. Imports by rail 3 tons.	0·59 tons to Rai Bareli by road. Exports by rail 307 tons.	1 11 0	,, ...	117 1 8	
		1873-74 ...	90,381								
		1874-75 ...	74,254								
		1875-76 ...	80,328								
		1876-77 ...	66,355								
	Allahabad ...	...	80,874	888	46	7,320 tons from Partabgarh by road. Imports by rail 200 tons.	2,226 tons to Partabgarh by road. Exports by rail 1,818 tons.	2 1 9	,, ...	105 1 8	
	Jaunpur ...	...	24,925	880	46	...	...	2 8 6	,, ...	*Vid* Benares ...	126 1 8
	Azamgarh...	...	24,058	922	46	305 tons from Bengal by road.	5 tons to Bengal by road.	Cartage to Shahganj railway station, Rs. 1-11 per ton. One ox-load to Jaunpur railway station at 15 annas.		From Shahganj ...	128 1 8
										Vid Benares and from Jaunpur ...	126 1 8
Benares.	Mirzapur ...	...	89,491	492	44	50 tons from Rewah by road. Imports by rail 495 tons	681 tons to Rewah by road. Exports by rail 122 tons	2 8 6	per ton	114 1 8	
	Benares ...	...	27,361	441	46	323 tons from Bengal by road. Imports by East Indian Railway 13 tons.	11 tons to Bengal by road. Exports by East Indian Railway 435 tons.	1 11 0	,, ...	122 1 8	
	Ghazipur ...	...	56,348	682	46	Imports by rail 0·81 tons.	Exports by rail 2 tons	5 1 0	,, to Sakaldiah railway station.	From Sakaldiah railway station	123 1 8
								1 4 3	,, to Buxar railway station.	From Buxar railway station, ...	131 1 8
	Gorakhpur...	...	152,713	920	49	94 tons from Bengal and Nepal by road.	638 tons to Bengal and Nepal by road.	To Patna and Fyzabad by river, Rs. 6 per 100 maunds. Cartage to Shahganj railway station, Rs. 1-4 3 per ton. Cartage to Zamaniah railway station, Rs. 5-1 per ton. Cartage to Fyzabad railway station, Rs. 6-12-9 per ton.		From Patna railway station	145 1 8
										From Fyzabad railway station	139 1 8
										From Zamaniah railway station	126 1 8
										From Shahganj railway station	128 1 8

X

Statement containing information regarding wheat (as far as obtainable), shown district by district—*concld.*

Division.	District.	Area (in acres) under wheat in each of the last five years to the end of 1876-77.		Average outturn (in lbs.) per acre.	Average wholesale price of wheat as given by district officers.	Annual imports into the district for five years, and places whence imported.	Annual exports from the district for five years, places whether exported, and proportion carried by rail, road or river.	Estimated average cost of carriage to the railway station nearest to the district.	Cost of transit to the port of shipment, Calcutta, Bombay or Kurrachee, by rail, road, &c.
1	2	3		4	4	6	7	8	9
		Years.	Acres.		lbs. per rupee.				Per 100 maunds = 3·70 tons.
Hill Tracts. Benares—*contd.*	Basti ...	...	161,205	922	55	159 tons from Nepal by road.	19 tons to Nepal by road.	Cartage to Fyzabad railway station, 30 miles, Rs. 3-12-9 per ton. Cartage to Akbarpur railway station, 50 miles, Rs. 5-7-9 per ton.	From Fyzabad railway station ... ... Rs. A. P. 139 1 8 From Akbarpur railway station ... 131 1 8 (*viâ* Benares).
	Dehra Dun	...	14,222	410	...	7,286 tons from Saharanpur and Bijnor by road.	42 tons to Saharanpur and Bijnor by road.	The railway station is at a distance of 44 miles.	From Saharanpur station 184 2 8
Lucknow.	Lucknow ...	1871 ...	105,418	616	42	...	...	...	Rs. A. P. 131 1 8
		1876-77 ...	114,924						
	Unao ...	1871-72 ...	84,660	740	41	...	...	...	128 1 8
		1872-73 ...	81,200						
		1873-74 ...	86,000						
		1874-75 ...	90,926						
		1875-76 ...	...						
		1876-77 ...	86,377					...	133 1 8
	Bara Banki	1871-72 ...	163,736	1,440	49	...	...	...	*Viâ* Lucknow ... 139 1 8
	Fyzabad ...	1871-72 ...	177,893	769	48	...	...		*Viâ* Benares ... 135 1 8
		1872-73 ...	170,893						
		1873-74 ...	168,893						
		1874-75 ...	168,393						
		1875-76 ...	157,798						
Fyzabad.	Bahraich ...	1871-72 ...	156,900	553	44	A small quantity of wheat is sometimes imported in March or April from Bara Banki and Nepal when the harvest is late.	8,333 tons by river and 3,703 tons by road were exported to Bengal, Fyzabad and Azamgarh.	Rs. A. P. Cartage to Bairamghat, per 100 maunds ... 7 14 0 Cartage to Nawabganj, per 100 maunds ... 18 0 0	From Bairamghat ... 135 1 8 „ Nawabganj ... 133 1 8
		1872-73 ...	159,000						
		1873-74 ...	107,125						
		1874-75 ...	120,540						
		1875-76 ...	113,000						

Sitapur.	Gonda ...	1871-72 ...	169,561	1,312	58	.....	.....	.....	From Nawabganj ...	133	1	8
		1872-73 ...	173,069						,, Fyzabad ...	139	1	8
		1873-74 ...	170,069						*Vid* Lucknow ...	135	1	8
		1874-75 ...	22,247(?)						*Vid* Benares ...			
		1875-76 ...	232,534									
	Sitapur ...	1872-73 ...	257,486	492	55	No means of ascertaining.	8,533 tons by road and 3,405 tons by river exported to Shahjahanpur, Lucknow and Fyzabad.	.....	From Bhagauli railway station ...	136	1	8
		1873-74 ...	256,144									
		1874-75 ...	259,118									
		1875-76 ...	320,660									
		1876-77 ...	289,391									
	Hardoi ...	1876-77 ...	311,000	738	55	*Nil* ...	20,740 tons were exported to Calcutta, Bombay, Cawnpore and Lucknow, of which one-third was carried by river and two-thirds by rail.	Rs. 4 per 100 maunds ...	To Bombay ...	137	1	8
	Kheri ...	1872-73 ...	84,586	586	...	*Nil* ...	19,323 tons were exported by road to Shahjahanpur and Lucknow.	.....	From Hardoi railway station ...	137	1	8
		1873-74 ...	92,844									
		1874-75 ...	100,005									
		1875-76 ...	108,719									
		1876-77 ...	107,053									
Rai Bareli.	Rai Bareli ...	1872-73 ...	149,500	1,227	45	.....	.....	.....	From Fatehpur railway station ...	117	1	8
		1873-74 ...	143,000									
		1874-75 ...	146,000									
		1875-76 ...	146,690									
		1876-77 ...	144,600									
	Sultanpur ...	1872-73 ...	96,125	960	42	.....	.....	.....	From Fyzabad railway station ...	139	1	8
		1873-74 ...	93,685									
		1874-75 ...	95,725									
		1875-76 ...	95,400									
		1876-77 ...	95,532									
	Partabgarh...	1871-72 ...	109,225	960	40	.....	.....	.....	From Allahaad railway station ...	105	1	8
		1872-73 ...	106,412									
		1873-74 ...	90,765									
		1874-75 ...	87,751									
		1875-76 ...	88,853									

Appendix B.

Statement showing prices of wheat prevailing in the different districts before and after the harvest during the last five years, taken from the price lists published in the Gazette.

Geographical division.	District.	1873.		1874.		1875.		1876.		1877.	
		Jan.: lbs. per rupee.	June: lbs. per rupee.	Jan.: lbs. per rupee.	June: lbs. per rupee.	Jan.: lbs. per rupee.	June: lbs. per rupee.	Jan.: lbs. per rupee.	June: lbs. per rupee.	Jan.: lbs. per rupee.	June lbs. per rupee.
Meerut Division (Upper Doab).	Saharanpur ...	45	39	40	43	44	48	46	49	49	45
	Muzaffarnagar ...	44	39	40	45	49	50	48	55	51	46
	Meerut ...	43	38	38	44	45	48	47	55	51	52
	Bulandshahr ...	43	38	39	44	47	50	54	60	50	48
	Aligarh ...	40	36	37	41	42	48	53	58	56	47
Rohilkhand.	Bijnor ...	38	33	32	39	41	44	45	46	45	47
	Moradabad ...	39	32	33	37	39	44	47	47	47	43
	Budaun ...	39	32	30	36	38	48	54	52	44	42
	Bareilly ...	35	32	28	35	35	44	50	48	40	40
	Shahjahanpur ...	37	30	31	40	42	53	62	55	46	47
	Terai ...	37	30	34	41	41	47	52	51	40	47
Agra Division (Middle Doab).	Muttra ...	36	32	34	36	40	42	48	51	51	42
	Agra ...	33	30	30	33	35	40	46	50	46	40
	Farakhabad ...	36	28	29	38	34	45	52	55	44	42
	Mainpuri ...	37	33	31	36	37	48	56	52	46	44
	Etawah ...	33	30	30	35	35	44	48	52	45	40
	Etah ...	40	34	34	39	39	47	56	58	48	46
Allahabad Bandelkhand Division (Trans-Jumna country).	Jalaun ...	32	27	26	37	40	42	44	60	56	48
	Jhansi ...	29	26	27	36	40	40	42	49	46	43
	Lalitpur ...	33	36	28	39	43	42	41	56	50	42
	Banda ...	31	26	26	31	38	40	49	53	50	43
	Hamirpur ...	32	27	27	31	39	42	48	56	56	48
	Cawnpore ...	33	30	32	35	39	47	55	47	40	36
	Fatehpur ...	31	28	30	33	37	44	53	55	42	38
	Allahabad ...	28	26	28	28	32	39	51	51	36	36
	Jaunpur ...	28	26	27	34	41	53	58	53	45	45
Benares Division.	Azamgarh ...	27	27	27	29	35	51	50	51	40	42
	Mirzapur ...	28	26	29	30	32	40	42	44	36	40
	Benares ...	28	25	28	28	32	43	50	47	41	36
	Ghazipur ...	23	25	31	29	36	38	49	49	40	41
	Gorakhpur ...	24	26	26	28	38	56	50	58	40	38
	Basti ...	25	27	28	27	39	53	60	60	43	42
Hill Tracts.	Dehra Dun ...	41	...	36	36	43	42	44	42	41	42
	Kumaun ...	25	21	20	25	28	24	27	32	28	28
	Garhwal ...	40	41	26	40	44	46	44	35	35	32
Lucknow Division.	Lucknow ...	28	26	29	33	41	50	60	56	42	42
	Unao ...	28	28	29	33	37	49	55	52	42	39
	Bara Banki ...	26	28	29	30	39	50	58	56	42	42
Sitapur Division.	Sitapur ...	30	34	33	40	45	60	74	69	48	49
	Hardoi ...	30	28	30	34	37	54	60	57	42	45
	Kheri ...	30	32	35	39	46	63	74	62	50	53
Fyzabad Division.	Fyzabad ...	24	28	29	31	38	52	61	53	44	38
	Bahraich ...	22	28	26	32	40	70	68	64	48	48
	Gonda ...	22	26	26	31	44	61	61	74	45	47
Rai Bareli Division.	Rai Bareli ...	30	28	32	35	42	50	61	59	45	40
	Sultanpur ...	24	26	27	34	40	50	60	58	46	44
	Partabgarh ...	24	28	30	35	40	55	58	62	47	...

Appendix C.

The superiority or inferiority of the different classes of wheat are judged according to the quality and quantity they yield.

First of suji or semoulie
Second of mayda or flour,
Third of ata or coarse flour,

which are the three kinds of wheat meal generally made and sold in these Provinces. Wheat with white, large, soft and full grain yields the best quality and the largest quantity of semoule, and is hence considered to be wheat of first quality. The different classes of wheat are valued according to the degree they approach this standard.

Suji (French semoule, Italian semolina) is the heart of the grain, and is obtained in the following way.

In the evening a quantity of wheat is moistened and left in a basket undried till the morning, when it is ground and passed, first, through a coarse, and secondly, through a fine, sieve. What passes through is mayda, or fine flour; and what remains consists of suji, bran, and the unground grains of wheat mixed. The suji is then separated in a winnowing basket (súp).

From 1 cwt. of good wheat the quantity of suji obtained in the first operation is 21lbs. and of mayda 14lbs. The bran and the unground grains of wheat are then a second time ground and sieved, and suji separated as above. The second operation yields 7lbs. of suji and 28lbs. of mayda. The remainder is a third time put through the mill; and the yield this time is 14lbs. of mayda. The remainder (28lbs.) is bran and husk, from which a coarse kind of ata is obtained. The total results are as follows:—

	lbs.
Suji	28
Mayda	56
Coarse flour, bran and husk	28
Total ...	112

According to another authority, the yield of meal from 1 cwt. of good wheat is as follows:—

	lbs.
Suji	22
Mayda	56
Ata	12
Bran and husk	22
Total ...	112

The difference is slight. The first figures were given by millers, and the second by wheat merchants.

Mayda (fine flour) is also made alone without extracting the suji. In this case yield from 1 cwt. of good wheat would be—

	lbs.
Mayda	70
Ata	14
Bran and husk	28
Total ...	112

Ata, or coarse flour, is obtained in the course of making suji or mayda, as shown above; but it is usually prepared by simply grinding the wheat, husk and all together, and then roughly sieving it. In 1 cwt. only 4 or 5 lbs. weight are thrown away as husk. Cakes (or chapatis) made of ata are the principal food of the people; at least of those who can afford to eat wheat. Mayda and suji are generally used by confectioners, and by the common people are considered as articles of luxury, and used only in times of feasts and festivals. Loaves used by Europeans in India are made of suji.

In the description of samples the word "semoule" stands for suji, "fine flour" for mayda, and "coarse flour" for ata.

The 220 samples of wheat received from the different districts for the Government of India were arranged by the wheat merchants of Allahabad and Cawnpore in the following 44 classes:—

CLASS I.

1. Mundia (muria) of Moradabad.

A beardless wheat, white, full and soft: 1 cwt. gives 56lbs. of white flour, 22lbs. of semoule, and 12lbs. of coarse flour (ata), the remainder being bran and husk. It yields a larger quantity of flour than other classes, and is exported to England.

CLASS II.

2. Mundia of Partabgarh.
3. Mundia of Rai Bareli.

Reddish white; remarks as above. The grain is a little larger.

CLASS III.

4. Muria ratua of Budaun.
5. Ratua of Budaun.
6. No. 1 of Kumaun (unnamed).
7. Muria of Hardoi.
8. Garhwal wheat (unnamed).

Reddish white; grain longer, but thinner; gives a larger quantity of bran but smaller quantity of starch; otherwise as I.

CLASS IV.

9. Anokha of Cawnpore.
10. Gajar of Agra.
11. Ratta of Agra.
12. Muria-pamaria of Bareilly.
13. Sambharia (first) of Bareilly.
14. Ratta of Bulandshahr.
15. Anokha of Etawah.
16. Ratta of Aligarh.

Reddish white; yields larger quantity of flour and bran and smaller quantity of semoule than I; grain thinner than I.

CLASS V.

17. Safed of Meerut.
18. Seta of Partabgarh.
19. Safeda of Muttra.

White, soft, and full; exported in large quantities to Europe: 1 cwt. yields 67lbs. of flour, 9lbs. semoule, 12lbs. coarse flour, and 24lbs. bran and husk.

CLASS VI.

20. Sambharia of Etah.
21. Muria of Unao.
22. Safeda of Mainpuri.
23. Sambharia of Mainpuri.
24. Pisi (second) of Lalitpur.
25. Desi of Cawnpore.
26. Gajar of Bulandshahr.

Remarks as in class V; grain a little thinner and longer.

CLASS VII.

27. Pisi (first) of Fatehpur.
28. Safed of Bulandshahr.

Reddish white, and a little hard: 1 cwt. gives 67lbs. of second quality flour, 27lbs. of coarse flour of the first quality, and 18lbs. of bran; sweet in taste; exported in moderate quantities to Europe; grain not of equal size; ordinary price 1lb. more per rupee than above.

CLASS VIII.

29. Muria of Meerut.
30. Muria of Cawnpore.

White: 1 cwt. gives 56 lbs. of flour, second quality, and 38 lbs. of coarse flour, first quality; exported in moderate quantities to Europe.

CLASS IX.

31. Kathia of Aligarh.
32. Barlamba of Bareilly.
33. Hasia nikasia of Lalitpur.
34. Jalali of Lalitpur.
35. Vilayati of Cawnpore.
36. Bhadia of Etah.
37. Bakasia of Jhansi.
38. Saman bargenhua of Unao.
39. Barha of Bulandshahr.
40. Vilayati of Sultanpur.
41. Anokha of Mainpuri.
42. Barha of Meerut.
43. Ratua of Budaun.

Reddish white: 1 cwt. gives 56lbs. of semoule, 22lbs. of flour, 11lbs. of coarse flour, and 23lbs. of bran. The colour of semoule is a little yellowish. The grain is much used for making semoule. Price 40lbs. per rupee. It is supposed to be an acclimatised foreign wheat.

CLASS X.

44. Muria of Bulandshahr.
45. Rai-munia of Budaun.

Remarks as above; grain round and smaller; semoule whiter.

CLASS XI.

46. Kathia paria of Bareilly.
47. Daudi of Bareilly.
48. Sambharia (first) of Farakhabad.
49. Muria of Farakhabad.
50. Samcharia (second) of Farakhabad.

Remarks as on class IX, grain smaller.

CLASS XII.

51. Muria of Saharanpur.
52. Tamra of Cawnpore.
53. Muria of Sitapur.
54. Mihrati of Dehra Dun.
55. Seta of Hardoi.
56. Sambharia of Hardoi.
57. Pisiya of Fatehpur.
58. Muria of Fatehpur.
59. Ratta of Etah.
60. Safeda of Unao.

Remarks as in class IX; grain full and softer, but smaller; semoule whiter; price 1lb. cheaper.

CLASS XIII.

61. Gajar of Etah.
62. Lalia of Mainpuri.
63. Muria of Cawnpore.

Reddish white: 1 cwt. gives 59lbs. of semoule, 34lbs. of coarse flour, and 11lbs. of bran, the rest being chaff: price 2lbs. cheaper than class IX.

CLASS XIV.

64. Manda of Bulandshahr.
65. Pisiya of Bareilly.
66. Manda of Muzaffarnagar.
67. Daudi of Ghazipur.
68, 69. Mihrati (second) of Dehra Dun.
70. Ujra of Gonda.
71. Seta of Lucknow.
72. Dina shahi of Sultanpur.
73. Seta of Rai Bareli.

Reddish white and hard: 1 cwt. gives 50lbs. of semoule, first quality, 28lbs. of flour, second quality, and 18lbs. of coarse flour, second quality. It is not much used for fine flour; price as class XIII.

CLASS XV.

74. Sambharia of Budaun.
75. Ratua of Budaun.
76. Kathia of Lucknow.
77. Gajar of Etawah.
78. Sambri of Shahjahanpur.
79. Surkh of Moradabad.
80. Kathia of Bareilly.
81. Seta of Sitapur.
82. Daudi of Mirzapur.

Whitish-red, long, hard and sweet: 1 cwt. gives 45lbs. of semoule, 23 lbs. flour, 27lbs. of coarse flour. Flour and ata are of reddish colour. Sent to Europe mixed with other white wheats not much used for semoule or flour.

CLASS XVI.

83. Seta of Cawnpore
84. Lalia of Sitapur.
85. Bhambua of Budaun.

White: 1 cwt. gives 45lbs. of flour, first quality, and 46lbs. of coarse flour; remainder bran and husk. Produces comparatively small quantity of semoule.

CLASS XVII.

86. Muria of Budaun.
87. Safeda of Muzaffarnagar.

Whitish-red, grain of moderate length and full; not much exported to Europe: 1 cwt. gives 94lbs. of coarse flour, the rest being bran and husk.

CLASS XVIII.

88. Sitia of Kheri.
89. Gajar of Meerut.
90. Samdhua of Bahraich.
91. Daudi of Benares.
92. Pisiya gangajali of Banda.
93. Daudi of Shahjahanpur.
94. Sambharia of Bareilly.
95. Daudi of Hardoi.

Reddish white; remarks as in class XVII, difference being in the size of grain, which is smaller and thinner than XVII.

CLASS XIX.

96. Safed of Fyzabad.
97. Lali sugarha of Bara Banki.
98. Kathia of Bara Banki.
99. Samdhava lal of Sultanpur.
100. Daudi of Sultanpur.
101. Daudi of Azamgarh.
102. Muria auwal of Moradabad.
103. Gangajali of Basti.

Remarks as in class XVIII, but grain harder, more reddish and more husky.

CLASS XX.

104. Gajra of Muzaffarnagar.

Reddish white, thin and short-sized: 1 cwt. yields 99lbs. of ata (coarse flour), the rest being bran and husk: grain a little sweet in taste; not exported.

CLASS XXI.

105. Sambharia of Kheri.

Remarks as in XX, but grain longer and little more reddish.

CLASS XXII.

106. Gangajali of Fyzabad.
107. Daudi of Fyzabad.
108. Mihrati of Dehra Dun. (?)
109. Mandwa of Sultanpur.
110. Chastia of Bahraich.

Remarks as in class XX, but grain redder and not so full.

CLASS XXIII.

111. Muria of Budaun.
112. Ratta of Budaun.
113. Ratta (first) of Moradabad.

Reddish white, grain larger, glossy, and with a greater proportion of husk.

CLASS XXIV.

114. Muria safed of Moradabad.
115. Muria khadir of Moradabad (first).
116. Muria safed of Moradabad (second).
117. Safed of Moradabad.
118. Daudi of Jaunpur.

Remarks as in XXIII, but grain not so big.

CLASS XXV.

119. Muria of Etawah.

Reddish white, long, a little hard but not full: 1 cwt. yields 90lbs. of coarse flour, the rest being husk and bran; not used for semoule or fine flour; not exported: price in ordinary seasons 50lbs. per rupee.

CLASS XXVI.

120. Lalia of Fatehpur.

Reddish white; remarks as in class XXV, but grain a little thinner and short-sized.

CLASS XXVII.

121. Pisiya of Etawah.
122. Chilkua of Etawah.

Remarks as in class XXV, but grain thinner and redder.

CLASS XXVIII.

123. Maria safed of Shahjahanpur.
124. Madnaiya of Etawah.
125. Mandia of Bareilly.
126. Mandia of Bahraich.
127. Raksua of Partabgarh.

Whitish-red; grain thin and short-sized: 1 cwt. gives 79lbs. of coarse flour of first quality, 10lbs. of coarse flour, second quality, the rest being bran: meal of moderate sweetness; not exported: sells cheaper than class XXV.

CLASS XXIX.

128. Gangajali of Banda.
129. Gangajali safed of Bara Banki.
130. Majna phulkhaja of Partabgarh.
131. Gajar of Farakhabad.

Half red, half white; grain a little long, thin and hard; in taste a little sweet; other remarks as in class XXVIII. The gangajali is not appreciated by exporters; it has the reputation of beingtoo hard for English millers.

CLASS XXX.

132. Sambharia of Farakhabad.
133. Gajra of Bareilly.
134. Ratua of Bareilly.

Reddish white; remarks as in class XXIX, but grain thinner and short-sized.

CLASS XXXI.

135. Desi of Benares.
136. Gangajali of Lucknow.

Remarks as in class XXX, but grain bigger and softer.

CLASS XXXII.

137. Ghabrasia of Lalitpur.

Reddish white, grain hard and big: 1 cwt. yields 84lbs. of coarse flour and 28lbs. of bran and husk; ata not at all good.

CLASS XXXIII.

138. Pisi-lal-kathni of Banda.
139. Sitia of Fatehpur.
140. Gajar of Agra.
141. (Unnamed) of Aligarh.
142. Gajar of Aligarh.
143. Phulkhaja of Bara Banki.
144. Mihrati of Dehra Dun. (?)
145. Gajar of Meerut.
146. Bhamuan of Bareilly.
147. Kathia of Hardoi.
148. Gajar of Muttra.
149. Lalia of Rai Bareli.

Whitish red, of moderate size, little hard: 1 cwt. yields 86lbs. of coarse flour of first quality and 7lbs. of second quality, the rest being bran and husk.

CLASS XXXIV.

150. Seta of Sultanpur.
151. Lalia of Sultanpur.
152. Daudi of Basti.
153. Muria surkh of Bareilly.

Reddish white; grain hard, little long and thin and husky, but sweet in taste: 1 cwt. yields 90lbs. of coarse flour, the rest being bran; said to be mixed with other wheat for export.

CLASS XXXV.

154. Tamra of Lucknow.
155. Daudi of Gonda.
156. Gangajali of Gonda.
157. Gaja of Saharanpur.

Whitish-red; grain smaller, but in other respects like class XXXIV.

CLASS XXXVI.

158. Dina shahi of Lucknow.
159. Kathia of Etah.

Whitish-red, longer and harder than class XXXIV; in taste a little sweeter: 1 cwt. yields 79lbs. of coarse flour, first quality, 9lbs. of second quality, the rest being bran and husk; not exported to Europe.

CLASS XXXVII.

160. Lalia of Bahraich.
161. Raksa of Bahraich.
162. Kathua of Kheri.
163. Muria of Kheri.
164. Samudhwa of Basti.
165. Raksa of Allahabad.

Remarks as in class XXXVI, but grain redder, harder and shorter sized.

CLASS XXXVIII.

166. Desi of Unao.
167. Kathia of Shahjahanpur.
168. Lalia of Jaunpur.
169. Lal of Benares.
170. Muria of Bara Banki.
171. Gajar of Budaun.

Reddish white; grain big, hard, not full, and in taste not sweet: 1 cwt. gives 95lbs. of coarse flour of second quality, the rest being bran; not exported, and not used for semoule or finer flour.

CLASS XXXIX.

172. Lalia-tisi of Mirzapur.
173. Lalia-bargenhua of Mirzapur.
174. Pisi of Jhansi.
175. Aligarh (unnamed).
176. Lal of Aligarh.
177. Pisiya of Cawnpore.
178. Lal of Muttra.

Deep red; grain long, big, a little hard, and of moderate sweetness; sells cheaper than class XXVIII; not exported to Europe: 1 cwt. gives 101lbs. of coarse flour of third quality, the rest being bran.

CLASS XL.

179. Lalia of Azamgarh.
180. Lalia of Gorakhpur.
181. Lalia of Fyzabad.
182. Samudhwa of Fyzabad.
183. Pisi of Allahabad.
184. Kathia of Farakhabad.
185. Surkh of Saharanpur.
186. Lal-tondudar of Dehra Dun.
187. Lal-gehun of Dehra Dun.

188. Ratta of Moradabad.
189. Mandwa of Moradabad.
190. Samudhwa of Gonda.
191. Garhwal (unnamed).
192. Kumaun (unnamed).
193. Surkh of Muzaffarnagar.

Remarks as in class XXXIX, but grain thinner and shorter.

CLASS XLI.

194. Kathia of Etawah.

Remarks as in class XXIX, but grain longer, bigger, harder and having more husk.

CLASS XLII.

195. Lalia of Agra.
196. Lal-khalis of Agra.
197. Kathia of Bareilly.
198. Lalia of Ghazipur.
199. Lal-tamhia of Etawah.
200. Lal of Bulandshahr.
201. Lal of Meerut.
202. Pisi (second) of Jalaun.
203. Lal-auwal of Muttra.
204. Lal of Mirzapur.
205. Pisi-lal of Lalitpur.

Remarks as in class XLI, but grain shorter.

CLASS XLIII.

206. Lalia of Gonda.
207. Gajar of Kheri.
208. Sugarha of Kheri.
209. Lalwa of Kheri.
210. Mangeri of Benares.
211. Lalia of Basti.

Redder than above, and grain smaller, but sweeter in taste; other remarks as in class XLII.

CLASS XLIV.

212. Basra of Jalaun.
213. Kusar of Dehra Dun.
214. Mihrati of Dehra Dun. (?)
215. Kathia of Allahabad.
216. Bargenhua of Allahabad.
217. Kathia of Fatehpur.
218. Kathia of Fatehpur.
219. Kathia of Cawnpore.
220. Kathia-lal-tamiha of Banda.

Red; grain very hard and large: 1 cwt. yields 95lbs. of ata (coarse flour), second quality, 9lbs. of bran, and the rest chaff. Flour cannot be made of it. Largely cultivated in Banda and adjoining districts; not exported to Europe.

No. 2131A., dated Naini Tal, the 22nd July 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am directed to submit, for the information of His Excellency in Council, copy of a letter* from the Director of Agriculture and Commerce, North-Western Provinces and Oudh, to the Secretary, Board of Revenue, North-Western Provinces, being a report on the experiments made during the year 1876-77 for the improvement of wheat in these Provinces.

* No. T.—319A., dated 31st May 1878.

No. T.—319A., dated Camp Cawnpore, the 31st May 1878.

From—F. N. WRIGHT, Esq., Officiating Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Board of Revenue, North-Western Provinces.

I have the honour to submit a report on the experiments made during the year 1876-77 for the improvement of wheat in these Provinces. It was delayed with the intention of including it in our general report for 1876-77 and 1877-78; but the replies from district officers as regards the results of the second year are so late, that I have thought it advisable to delay a report for the first year no longer.

2. A commencement was made in August 1876, when the Deputy Commissioner of Jubbulpore was requested to procure for this Department Rs. 100 worth of the "best white Jubbulpore wheat." The Deputy Commissioner sent samples of three kinds, as follows:—

Mandi pisi.
Sikria pisi.
Jalalia (otherwise known as ekdana, largely grown in Sohagpur of the Hoshangabad district).

3. The "best white" was selected, as distributed as follows:—

Name of parties supplied with seed.	Quantity supplied.
Collector of Fatehpur	10 maunds.
Collector of Etawah	20 „
Superintendent of Terai	39 „
Superintendent, Government Experimental Farm, Cawnpore.	33 „
Superintendent, Government Experimental Farm, Allahabad	10 „
Lachmi Narain, Banker, Bareilly ...	10 „
TOTAL ...	122 „.

4. The wheat received was not thoroughly cleaned; it contained a few grains of barley, or a small grey field pea. This was cleaned out at

Cawnpore; and in any case the proportion of foreign grain was so small as to be easily removed by hand during the growth of the crop.

5. The general result of the experiment, in brief, was a failure. The reports from every locality where the wheat was grown state that, owing to continuous rain and cloudy weather, rust (girni) was engendered, and in all instances the outturn was trifling in quantity and poor in quality.

6. The season was no doubt most unpropitious for the experiment; but it would seem from the remarks of the Collector of Etawah that the ordinary country wheat did not suffer so extensively from rust, and the prevalent impression was that the Jubbulpore seed was unfitted for irrigated (especially canal-irrigated) land, and was better adapted to mar and other cognate soils. I may anticipate the report of the experiments made during 1877-78, so far as to say that the result obtained in that year is the same. The Jubbulpore wheat is too soft a kind for the soils and method of cultivation which prevail in the upper districts of these Provinces; and the importation of Jubbulpore wheat has been discontinued.

7. It was arranged that payment for the seed supplied was to be made in kind; but the results of the experiment necessitated this arrangement being modified. In some instances payment in cash, in some instances payment in kind, was made, and the grain received was pronounced to be inferior to that distributed. It was not therefore used the following year as seed, except the wheat produced in Fatehpur and Cawnpore Farm, which was not much inferior to the original seed.

No. 2132A., dated Naini Tal, the 22nd July 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of my letter No. 2131A. of this day's date, I am directed to submit, for the information of His Excellency in Council, a copy of the correspondence marginally noted regarding operations undertaken for improving the quality of wheat in these Provinces.

From Director of Agriculture and Commerce, North-Western Provinces and Oudh, No. T.—19A., dated 3rd July 1876, and enclosures.

From Secretary, Board of Revenue, North-Western Provinces, No. 1407—VII-N., dated 21st September 1876.

From Director of Agriculture, North-Western Provinces and Oudh, No. T.— 229A., dated 16th July 1877, and enclosures.

From Director of Agriculture and Commerce, North-Western Provinces and Oudh, No. T.—413A., dated 8th August 1877.

From Commissioner, Meerut, No. 54, dated 13th September 1877, and enclosure.

From Director of Agriculture and Commerce, North-Western Provinces and Oudh, No. T.—507A., dated 9th October 1877.

From Director of Agriculture and Commerce, North-Western Provinces and Oudh, No. T.—453A., dated 28th June 1878.

No. T.—19A., dated Naini Tal, the 3rd July 1876.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces,

To—The Offg. Secy. to the Govt., North-Western Provinces.

I have the honour to forward a copy of a letter from the Secretary to the Agricultural Society, Calcutta, on the subject of wheat-seed; also

a copy of an extract of a letter from Messrs. Begg, Sutherland of Cawnpore on the same subject.

2. There is no doubt but that the cultivation of white wheat may be extended, and also that its quality may be improved by a careful collection of seed. The enquiries which I have made lead me to believe that cultivators are, on the whole, very careless about their seed, taking in many cases whatever the village bania gives them at random.

3. I suggest the following arrangement:—

(1) That a sum of Rs. 500 should be placed under my control for the purchase of selected white dudhia seed.

(2) That the seed be given in advance to such cultivators of Court of Wards' estates in which there is suitable land for wheat cultivation as may agree to grow it.

(3) That an agreement may be made with the cultivators to supply at harvest four times the amount of seed supplied to them on the following conditions—

1*st*.—That they supply the best grains of the outturn.

2*nd*.—That they receive a price for three-fourths of the quantity at a price a little above the market price in return for their trouble in selecting seed, one-fourth being given in return for the seed advanced to them.

4. I should employ the supervisor kanungos or the managers of Court of Wards' estates in supervising the selection of seed.

5. After the first year I should propose to distribute the seed thus obtained more generally, *i.e.*, among cultivators of estates other than Court of Wards' estates.

6. I think that it is possible in the above way to effect a general improvement in the wheat-supply of these Provinces.

7. I propose to try experiments with other seed (if I can procure them) on the Government farms.

Dated Calcutta, the 26th June 1876.

From—A. H. Blechynden, Esq., Secretary to the Agricultural and Horticultural Society of India,

To—The Director of Agriculture and Commerce, North-Western Provinces.

In reply to your letter of the 17th instant, I beg to remark as follows.

(*a*) The kinds of Indian wheat which at present finds most favour in the English market are—

(1) The pure white dudhia wheat, which is classed club No. 1, but of which very little is at present available.

(2) The mixed red and white dudhia, classed in London as club No. 2, and is the favourite quality for shipment.

(3) Gangajoli, a hard red wheat.

(4) Jowali, a soft red wheat.

(*b*) Your second query cannot be satisfactorily answered till many well-conducted experiments have been instituted. There are some fine

kinds of wheat, I believe, at present confined to the Nerbudda valley—one known as the Jubbulpore wheat—which should be tried in other parts of India, also the Pegu wheat. Of foreign (African) wheats, that of Egypt might be tried; whilst of European wheats, perhaps certain kinds from Spain and Poland, as also the Dantzic wheat, should be considered worthy of trial, to ascertain how far any or all are suitable for cultivation in this country. The wheats of Austria, which are considered A1 in the English market, might likewise be tried.

The proceedings of this Society for the past forty years show that the subject of improved wheat cultivation had not been lost sight of. Now that the export trade is considerable, and so rapidly extending, it is probable some of the suggestions advanced at various times by several correspondents may be deemed deserving of consideration.

Extract from a letter from Messrs. Begg, Sutherland of Cawnpore, to the Director of Agriculture and Commerce, North-Western Provinces, dated 21st June 1876.

Two classes of wheats come into the Cawnpore markets, *viz.*, white and red. The former is generally simply cleaned down to 4 per cent. and then despatched to Calcutta; but the latter is usually mixed with one-third or half of white wheats before despatch, it not being considered, we believe, of sufficiently good quality by itself to meet the requirements of the English markets.

Cawnpore mixed wheat, *i.e.*, red and white, has been in pretty fair demand in the Calcutta markets during the past season at prices ranging from Rs. 2-2 to Rs. 2-8 per maund. This grain is, we understand, pretty well liked by the buyers for the English markets, on account of its whiteness and the quantity of glutinous matter that it contains; but they would, doubtless, give 2 or 3 annas per maund more for it if it were as hard and bold as the "pedigree" and "Jubbulpore" wheat is.

No. 1407—VII-N., dated Naini Tal, the 21st September 1876.

From—C. H. T. Crosthwaite, Officiating Secretary to the Board of Revenue, North-Western Provinces,

To—The Director of Agriculture and Commerce, North-Western Provinces.

I am desired to acknowledge your letter No. 696A.—LXXV-18, dated the 23rd of August 1876, submitting the draft of a proposed circular letter regarding the distribution of wheat-seed, to which you desire the sanction of the Board of Revenue.

2. The circular, in the Board's opinion, is not calculated to secure your object. In the first place, the selection of the seed on which the success of the experiment depends is left to the managers of the Court of Wards' villages and to the supervisor kanungos, who may or may not know anything about wheat. In the next place, the supervision and interference to which the cultivators will be subjected under your proposals will render them averse to taking seed. The small advances

to be made for the purchase of seed from the funds of each estate, and afterwards recovered from your department, will also entail much unnecessary trouble.

3. The Board consider that you should cause the wheat for seed to be selected and brought under your own supervision at Cawnpore or some other market, whence it can be distributed in sealed bags to the different villages in which you wish it sown. The distribution can be made through the Collectors. The Board doubt the wisdom of imposing any conditions on the cultivators who sow the seed. It is improbable that supervisor kanungos will perform duties of this sort themselves, and the agent who will deal with the cultivator will most likely be a chuprassie. The offer of a liberal price for fine selected grain will secure your object.

4. The Board suggest that the best way in their opinion of attaining your object will be the establishment of seed godowns in favourable localities for the distribution of good seed. The places might be so chosen, that you could easily inspect the growing wheat, or get some of the district officers to do so. The cultivators would gladly avail themselves of facilities for procuring good seed, which they are now often unable to get.

No. T.—229A., dated Naini Tal, the 16th July 1877.

From—E. C. Buck, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government, North-Western Provinces and Oudh.

I have the honour to forward herewith copies of correspondence with the Board of Revenue, regarding the distribution of wheat-seed in Court of Wards' estates, and to request the favour of the advance of Rs. 500 sanctioned last year, but not utilised in consequence of the Board's disagreement with the arrangements proposed, being renewed this year.

* No. 135A., dated 22nd June, to Secrerary, Board of Revenue, and his reply.

2. The sum will be recovered when the harvest is gathered in, either in cash or in seed.

No. T.—135A., dated Naini Tal, the 22nd June 1877.

From—E. C. Buck, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Board of Revenue, North-Western Provinces.

I have the honour to make the following representations to the Board regarding the improvement of wheat-seed in Court of Wards' estates.

2. Last year I made proposals to Government in my letter No. T.—19A., dated 3rd July 1876, to attempt the improvement of seed by means of Court of Wards' estates. Government approved of the general plan which I proposed; but the Junior Member of the Board of Revenue

disapproved both of the plan and of the details, and addressed Government on the subject, on which Government desired me to follow the Board's suggestions. It was then, however, much too late to sow any seed at all.

3. The Board's suggestions are contained in letter No. 1407—VII-N., dated 21st September 1876, to my address. I do not, however, believe that it will be easy to keep seed good in large central godowns. I fear the effects of mildew, weevils, rats and thieves, and should hesitate to undertake the responsibility. I should much prefer to attempt the introduction of a system, if it can be introduced at all, by which cultivators keep seed themselves, and make use of their own improved seed.

4. My proposals would have given little or no trouble to Collectors; but I fear that if the distribution of seed is to be worked through Collectors, the attempt will fail, being sure as I am that those officers have too much to do to take up special work of this troublesome kind.

5. Whatever course the Board may wish me to pursue, I shall be glad of early orders to enable me to take any steps which may be necessary. Should the Board desire, I will consult them at a personal interview, and, after discussing the matter and hearing their general wishes, will draft proposals for their sanction.

No. 500—VII-13N., dated Naini Tal, the 12th July 1877.

From—J. S. Mackintosh, Esq., Offg. Secretary to the Board of Revenue, North-Western Provinces,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

I am directed to acknowledge the receipt of your No. T.—135 A., dated 22nd ultimo, regarding the improvement of wheat-seed by means of estates under the Court of Wards.

2. The Senior Member has no objection to your carrying out experiments in any way that may be suitable to you for the above purpose; and he requests that you will do so, and that you will report at the end of the season the result of your experiments.

No. T.—413 A., dated Naini Tal, the 8th August 1877.

From—E. C. Buck, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Offg. Secy. to the Govt., North-Western Provinces and Oudh.

In continuation of this office No. T.—229A., dated 16th July 1877, I have the honour to forward, for the information and sanction of Government, a circular which I propose to issue to the Commissioners of Meerut, Agra and Jhansi, which in my opinion are the best wheat-growing divisions in these Provinces.

2. At the same time I doubt whether any great interest will be taken in the measure, unless local officers are fully assured by Government that it is their wish that action should be taken with energy and real intention. I venture, therefore, to ask that a short circular may be

issued in the name of Government, and with the signature of the Secretary to Government, informing the Commissioners of the divisions named that Government have directed that active measures for the improvement of wheat-seed should be taken in this Department through Courts of Wards' estates, and directing them to require the Collectors of their divisions to select land for the purpose in every estate in which the soil is suitable.

3. The Board have now, in the letter which I forwarded with my letter No. T.—229A., dated 16th July 1877, given me free permission to make whatever arrangements I consider most suitable; and the difficulties which prevented my taking action last year have therefore been removed.

4. The Commissioner of Jubbulpore has forwarded me samples of good Jubbulpore wheats which have gone to Calcutta for selection of the best kind by exporting merchants. I have also received an offer, through a Calcutta merchant, introduced to me by the Government of Bengal, to provide me with 20 sacks of the finest English wheat, which I have accepted—an offer which will, I hope, be considered to justify me in asking Government to give me their support in carrying out the proposed arrangements, as the seed would be more or less wasted unless I receive the assistance of Collectors on Court of Wards' estates.

5. I beg permission finally to draw attention to the Resolution of the Government of India in the Department of Revenue, Agriculture and Commerce, No. 1-42, dated the 14th March, in which suggestions are invited for the development of the trade, and in which the anxiety of the Government of India that steps should be taken to improve the character of wheat is manifested.

No. 54, dated Meerut, the 13th September 1877.

From—E. COLVIN, Esq., Offg. Commissioner, 1st (or Meerut) Divn.,
To—The Secretary to the Government, North-Western Provinces and Oudh.

A copy of your letter No. 1662A., dated the 13th ultimo (Revenue Department), regarding the experimental cultivation of wheat, was communicated to the Collectors of Saharanpur, Muzaffarnagar, Meerut and Bulandshahr. Court of Wards' properties are situated in their districts. The substance of their replies is as follows.

Saharanpur.—As under the Board's sanction the landed property of the Sambhalhera Estate is about to be mortgaged for payment of debts, the mortgagee being placed in possession, the Collector will not be able to undertake the experiment, but is willing to give the seed a trial elsewhere, if desired.

Muzaffarnagar.—The Collector will give the experiment a trial; and a copy of his letter No. 326, dated the 8th instant, is submitted for orders.

Meerut.—The Officiating Collector, Mr. Joseph Smith, promises to do his best.

Bulandshahr.—The circumstances of the estates in this district are not favourable to the experiment being tried.

No. 326, dated Muzaffarnagar, the 8th September 1877.

From—A. SELLS, Esq., Offg. Collector of Muzaffarnagar,
To—The Commissioner, Meerut Division.

In reply to the question conveyed in your docket No. 206, dated 30th August, I have the honour to state that there is suitable land for wheat cultivation in the villages marginally noted belonging to the Sambhalhera Estate under the Court of Wards.

Belra.	Ralpur.
Rajpur Khurd.	Tikola.

There is no seer land; but there would, I anticipate, be no difficulty in inducing the cultivators selected to try the experiment on the assurance that really good seed is furnished to them; that it is seed about the germination of which there will be as little doubt as in the case of the seed ordinarily sown by them.

2. I would observe, however, that in the Government letter no clue has been afforded as to the amount of seed for which arrangements are to be made; and it is advisable that information on this point should be furnished at an early date, in order that the actual area for the crop may be selected.

No. T.—507A., dated Naini Tal, the 9th October 1877.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,
To—The Secretary to Government, N. W. Provinces and Oudh.

In reply to his No. 2187A., dated 25th September, I have the honour to state that Commissioners had been asked to send indents at the rate of 50 seers an acre, the acreage being determined by themselves.

No. T.—453A., dated Naini Tal, the 28th June 1878.

From—F. N. WRIGHT, Esq., Offg. Director of Agriculture and Commerce, North-Western Provinces and Oudh,
To—The Secretary to the Board of Revenue, N. W. P. and Oudh.

In continuation of this office No. 319A., dated 31st May 1878, I have the honour to report on the result of the operations undertaken by this Department in 1877-78 for improving the quality of wheat in these Provinces.

2. The permission of the Board to the arrangements proposed by Mr. Buck for carrying on the operations was given by their No. 500N., dated 12th July 1877; and, with the view of inducing district officers to take an interest in the work, Government was moved to address the Commissioners of Meerut, Agra and Jhansi on the subject.

3. Steps were taken at the same time to obtain good seed for distribution. The wheat exported from Delhi and Central Provinces being ascertained to be that most valued for export to Europe, the Commissioners of Jubbulpore and Delhi were asked to send samples of the best

kinds of white wheat, which on receipt was examined by experts. The Jubbulpore wheat selected for distribution was one of the finest varieties of wheat produced in India. Messrs. Hoare, Miller & Co., a large grain-exporting firm of Calcutta, called it a "beautiful wheat, soft and plump of grain, and highly desirable for the English market, and far to be preferred to the hard-grained semi-white wheat grown about Agra and Etawah." The Delhi wheat selected was of middling quality.

4. But the drought of the last year, which destroyed almost entirely the kharif crops, clouded the prospect of the rabi also; and it was at one time doubted whether it would be advisable to distribute any wheat at all. A circular was actually drafted, and sent to Government for approval, stopping the operations. But the timely fall of rain in October rendered its issue unnecessary, and the seed was distributed.

5. The seed sent out was of three kinds :—

(1) Ekdana wheat from Jubbulpore, mentioned above.
(2) Delhi wheat.
(3) Seed produced from the Jubbulpore wheat obtained last year.

The last was not so good as the first two, and was sent out by the Superintendent of the Cawnpore Farm, contrary to Mr. Buck's instructions. The following is the distribution list :—

District.	Jubbulpore ekdana seed.	Delhi seed.	Acclimatised Jubbulpore seed.	Total.
	M. S. C.	M. S. C.	M. S. C.	M. S. C.
Dehra Dun	9 0 0	...	16 0 0	25 0 0
Saharanpur	...	15 0 0	...	15 0 0
Muzaffarnagar ...	...	8 0 0	11 0 0	19 0 0
Meerut	20 0 0	...	17 20 0	37 20 0
Budaon (to Mr. Wyer) ...	1 0 0	...	...	1 0 0
Agra	1 20 0	...	...	1 20 0
Mainpuri	10 0 0	...	...	10 0 0
Etah	...	...	2 20 0	2 20 0
Jalaun	0 1 0	...	9 32 0	9 33 0
Jhansi	0 2 0	25 0 0	...	25 2 0
Lalitpur	0 1 0	...	5 0 0	5 1 0
TOTAL ...	41 24 0	48 0 0	61 32 0	151 16 0

Fifty maunds of seed were obtained from both Jubbulpore and Delhi, the balance undistributed was sown on the Cawnpore Farm.

6. Before distribution, the seed was carefully cleaned by machinery at the Cawnpore Farm, and any barley, peas, &c., found in it picked out.

7. The district officers appear to have taken considerable interest in the cultivation. The land was carefully prepared, and everywhere special care was bestowed. The plants, especially the Jubbulpore ekdana wheat, throve at first extremely well, and gave promise of a luxuriant crop; but towards the latter part of the season rust appeared and at

once ruined the crops. The outturn was extremely unsatisfactory both in quantity and quality. All the three kinds of wheat suffered from the blight; and the result of last year's operations was a failure.

8. The following extracts are made from the district officers' reports:—

Dehra Dun.—Seed was sown by Colonel Ousely, Mr. Vansittart, and by the Superintendent in three different places; but the result everywhere was the same. The seed germinated beautifully, and up to a certain height the plants grew splendidly. Natives were interested observers of the experiment; but as it grew up, it became attacked with blight, which got worse and worse until there was nothing left, not even a single grain. Native wheat, planted side by side with the imported wheat, and treated exactly in the same manner, throve beautifully. Colonel Ousely reports that a red blight or rust completely overpowered the crop.

Saharanpur.—Fifteen maunds of Delhi seed were sent to Saharanpur. The seed was given over to one Kuwur Sen, zamindar, who has often before shown considerable interest in agricultural experiments. The Collector himself also personally inspected more than once the seed-growing crop. The seed was sown on twelve acres of manured and irrigated land, and germinated well. The grain, however, was somewhat damaged by the strong west wind that blew between the 27th and the 31st March. At the time of harvesting, and on the threshing-floor, it was also much damaged by constant wind and rain. The outturn was 138 maunds of grain and 276 maunds of bhusa. The cost of cultivation was Rs. 301, and the value of produce Rs. 414, exclusive of the price of seed.

Muzaffarnagar.—Eight maunds of Delhi and 11 maunds of acclimatised Jubbulpore seed were sent to this district; but the results in both cases were unsuccessful. Mr. Sells reports: "The wheat-seed was sown in Court of Wards' estates in Tikola, Rajpur Khurd, Jansath and Talrah. The result in all cases has been unfavourable. The produce has been inferior. I myself examined the grain just at reaping-time in the fields at Tikola and Jansath and in granary at Rajpur Khurd. The quality of all was the same—thin and inferior to the product of country seed close round; and yet it was sown in good manured soil, and I have every reason to believe it was well cared for in all respects. The cultivators say that the seed was of excellent quality, but too good for the soil; that the young plants promised exceedingly well, growing luxuriantly, but that afterwards the soil seemed to have exhausted, and not to have sufficient nourishment in it to bring the grain to perfection. I am not prepared to say how far this is true; but it is certain that, even as compared with the country wheat growing in adjacent fields, the ears of the Government wheat were very thin and small." No mention is here made of the blight; and the cost and outturn of cultivation are not given. But the suggestion of an exhausted soil, unable to supply sufficient food to a strong and (I may say) greedy plant, is of much scientific interest.

Meerut.—Twenty maunds of fresh Jubbulpore and 17½ maunds of acclimatised seed were sent. The result, as in other places, was a failure.

The plants promised remarkably well at first; but the hot wind blew at the time when the ear was filling and severely injured the crops.

Budaun.—One maund of Jubbulprore new seed were sent to Mr. Wyer, Assistant Collector of Budaun. The seed was distributed in small quantities to zamindars and others, and no returns of the cultivation are accordingly available. The wheat grew well; but was very light in the ear, owing to the prevalence of a cold wind at the time when the grain was forming in the ear.

Agra.—One and a half maunds of Jubbulpore seed were sent for sowing in the Awa Estate, and were distributed among five villages. The plants, as in other places, at first gave great promise; but at the end a blight, locally called "ratua," appeared, which is said to be prevalent in irrigated lands. The outturn, five maunds, was greatly inferior in quality to the seed sown.

Mainpuri.—Ten maunds of fresh Jubbulpore seed were sent to this district. Mr. Young writes: "I sent 9½ maunds for sowing in the Arjunpur Estate held under Court of Wards, and reserved 20 seers for sowing in my own compound for experiment. The wheat at first flourished well; but, I am sorry to inform you, it is now entirely ruined by girna, which I suppose is identical with our rust. Side by side with it was a crop of country wheat sown with mustard, and it has done exceedingly well, though the soil and treatment was identical with those of the wheat sown by its side."

Jalaun.—Nine maunds and 32 seers of acclimatised and one seer of fresh Jubbulpore seed were sown in this district. The result is the same as in other districts, the crop being severely injured by blight, locally called girna.

Jhansi.—Twenty-five maunds of Delhi seed were sent to this district, and sown in 18 villages. The average outturn per acre obtained from different kinds of soil was—mar, 6 maunds 15 seers; kabar, 7 maunds 24 seers; rakar moti, 5 maunds 13 seers; and parua, 3 maunds 10 seers. The cultivators state that the produce would have far exceeded the ordinary country wheat, had not the crops been injured by blight. In Mr. Porter's garden 20 seers of the Delhi seed were sown on 1 rood 20 poles of land. The outturn was 9 maunds, or about 21 maunds per acre. No injury was done to this by blight; and the produce was exceptional, owing to the cultivation being carried on under Mr. Porter's immediate superintendence. Besides the Delhi seed, two seers of the Jubbulpore seed was also sent to Jhansi, of which the outturn was very small and inferior, owing to injury by blight. The outturn from the 25 maunds of Delhi seed, including Mr. Porter's, was 80 maunds of grain and 215 maunds of bhusa.

Lalitpur.—Five maunds of acclimatised and one seer of fresh Jubbulpore seed were supplied. The former, as in other places, has proved unsuccessful, but the latter has produced an outturn of ten times the seed sown, which has been kept in the Deputy Commissioner's office as pedigree seed.

9. The above reports would seem to show that the Jubbulpore wheat when cultivated in the North-Western Provinces is most liable to the

attacks of rust. This fact, however, cannot be said to have been decidedly proved, as a report has been received from the Commissioner of Jubbulpore, stating that the wheat crop in the Central Provinces also has been seriously injured by rust this year. At any rate, no extensive distribution will be made of it in future; but attempts will be made to thoroughly acclimatise it in the wheat-growing parts of the North-Western Provinces. The Delhi wheat has a fair chance of success. Considering the unfavourable character of the season in its latter part, it has done well both in Saharanpur and Jhansi, where large quantities of it were sent.

10. The cost of last year's operations was as follows:—

	Rs.	A.	P.
Price of Jubbulpore seed	154	9	0
Price of Delhi seed	120	4	9
Price of acclimatised seed	188	0	0
Carriage from Jubbulpore and Delhi ...	97	14	0
Freight paid for sending out seed to districts and packing	177	4	3
TOTAL ...	738	0	0

Part of this sum only will be realised from the sale of seed recovered from the cultivators. The expenditure was chiefly met from the Rs. 500 sanctioned by Government in General Order No. 1523A., dated 1st August 1877.

11. When the seed was distributed, the district officers were informed that no price would be charged to cultivators for seed supplied for sowing, but the value would be recovered by taking the same quantity of seed at harvest; and that the best portion of the outturn, not exceeding one-half and not less than a quarter, should be sifted out and preserved as seed for distribution in the following year. Except in the case of the Delhi wheat, the deterioration in quality of the outturn has rendered this mode of continuing the operations impossible. The outturn of the Delhi wheat in Jhansi and Saharanpur only will be used for the sowings of 1878-79.

12. The price of wheat being this year very high, the operations of next year (1878-79) will consist in purchasing of the best kinds of white wheat produced in the Meerut Division, cleaning and storing it at the Cawnpore Farm, and selling it as seed at the market price to the cultivators in the sowing season. For this purpose arrangements have already been made for storing 400 maunds of wheat.

13. Considerable interest is taken by the outside public in these experiments. Messrs. Hoare, Miller & Co., before mentioned, brought out last year at their own expense upwards of 50 maunds of English wheat-seed; but it was found that the vitality of the seed was destroyed on the voyage. A small portion only of it was sown, which did not germinate. The firm has again this year imported 120 maunds of good English seed (special care being taken of it during transit to India), which have been made over to this Department for distribution.

14. Experiments were also made on the farms with Australian and other kinds of wheat, but have not yet reached such a stage as to call for any report.

No. 2727A., dated Naini Tal, the 9th September 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Dept. of Revenue, Agriculture and Commerce.

With reference to Government of India, Department of Revenue, Agriculture and Commerce, Resolution No. 1-42, dated the 14th March 1877, I am directed to submit, for the consideration of His Excellency the Governor General in Council, a copy of the papers noted in the margin regarding the trade with Europe in Indian wheat.

From Director of Agriculture and Commerce, N. W. P. and Oudh, No. 1396A / C. L. XXVII, dated the 23rd August 1878.
Proceedings of this Government for June 1877, Index Nos. 35-37.

No. 1396A / C. L. XXVII, dated Allahabad, the 23rd August 1878.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government of the North-Western Provinces and Oudh.

I have the honour to call the attention of Government to a note on the cost and profits of wheat export submitted with my No. 884A., dated 11th December 1876.

2. The price of wheat in England is now from 48*s*. to 56*s*. per quarter exchange on demand 1-8$\frac{1}{16}$; and the price of wheat at Cawnpore is about Rs. 3 a maund.

3. If therefore, as proved in my note, wheat costing Rs. 1-9-9 at Cawnpore (the price ruling when I wrote) requires, with exchange at 1-7½, a home price of 44*s*. a quarter to make a transaction pay, it is impossible, with exchange at 1-8$\frac{1}{16}$, that export can be profitable with the present local high prices, or even with prices considerably below them, notwithstanding the improved position of wheat in the English market and the better value ruling for it now than in 1876.

4. It is from the highest considerations desirable that grain exports should be fostered. The agricultural section will naturally enough not grow more grain than is necessary to feed the whole population of the country in ordinary years (including the normal stocks in the hands of grain merchants), all excess being waste and tending to reduce prices. When their grain area, therefore, has been made large enough for the ordinary food-supply, they turn to indigo, sugar, opium, cotton, oilseeds, and other produce not used as food for the supply of larger profits than excess grain would give them. There is, therefore, no margin on which to fall back in a famine year, unless there exists a grain export which can be retained in the country under circumstances of unusual pressure. (It is said that in 1877 some grain cargoes were recalled even from Aden.)

I solicit again, therefore, that the attention of the Government of India may be drawn to the suggestion contained in paragraphs 9 and 10, that Government and Railway authorities should encourage by lower railway tarifs the grain export trade. A special meeting, as proposed in

my paragraph 10, would not now be necessary, as I understand that a Railway Conference is to take place at Simla; and I suggest that my letters should be placed before them, with such orders as Government may be pleased to pass.

I need hardly inform Government that wheat exports for 1878 are not likely to exceed one-fourth of the quantity exported in 1877, and much of the grain actually sent away this year is believed to have been sent at a loss by local consignors under prearranged contracts.

Extract from the Proceedings of the Government of the North-Western Provinces and Oudh in the Revenue Department for June 1877, Nos. 35 to 37.

Read the following papers :—

No. 35.] No. $\frac{881A.}{LXXV.}$, dated Camp Etawah, the 11th December 1876.

From—E. C. Buck, Esq., Director of Agriculture and Commerce, North-Western Provinces,

To—The Officiating Secretary to Government, North-Western Provinces.

I have the honour to submit the following note on the wheat trade for the information of Government and for consideration of the suggestion contained in paragraph 10.

2. The following figures are based upon an actual transaction in wheat between Cawnpore, Calcutta, and London.

Mixed white and red wheat, classed in the trade as "club No. 2," was bought in the Cawnpore market.

	Rs.	A.	P.	
The price was	1	9	9	a maund of 82 lbs. in the Cawnpore bazar.
	0	11	0	„ were paid for railway freight.
	0	0	5	„ „ for brokerage in Calcutta at 1 per cent.
	2	5	2	

Price given by Calcutta firm giving order was Rs. 2-7, leaving 2 annas 10 pies per maund for cartage from market, cleaning and cartage to railway.

Profits were practically *nil*. The transaction was, indeed, made more in order to show how the quality of wheat of this class was improved by its being thoroughly cleaned than to secure a profit.

3. The following are the charges between Calcutta and London :—

Charges in India.	Rs.	A.	P.
Price of 1 maund of wheat, 82 lbs. per maund, landed at Howrah railway station	2	7	0
Cost of transit from Howrah to ship's hold and other Calcutta charges, *e.g.*, dues, commission, bill of lading, &c., say Rs. 12-8 per 100 maunds ...	0	2	0
Total charges in India ...	2	9	0
Converting the above to shillings and pence at 1*s.* 7½*d.* (the quoted rate at the time), the total charges in India are	£	*s.*	*d.*
	0	4	3

Charges in England.

	£	s.	d.
Freight based on Calcutta quotations of 4th September = £3 a ton. Primage 15 per cent. of above =9*s.* a ton, or per maund of 82lbs.	0	2	6¼
Charges in India and England on one maund of 82lbs., exclusive of general charges	0	6	9¼

General charges are calculated on sale price as follows:—

Marine insurance	1½ per cent.
Risk of sea damage	1 „
Loss in weight	2 „
Discount and brokerage	2½ „
Telegrams and petty	1 „
Total ...	8 per cent. on sale price.

	£	s.	d.
Now, assume that 7*s.* 4¼*d.* is the price per maund of 82lbs., and we have general charges, or 8 per cent.	0	0	7
Total charges in India and England, including general charges, are therefore 6*s.* 9¼*d.* + 7*d.* = ...	0	7	4¼

But 7*s.* 4¼*d.* per maund is the same as 44*s.* 1*d.* a quarter. The result of the above figures is, therefore, that wheat, bought at Cawnpore at Rs. 1-9-9 per maund of 82lbs., must realise 44*s.* 1*d.* a quarter to cover expenses.

4. The figures in the above statement are all actual quotations, except the charges for cartage and cleaning in Cawnpore, and for transit from Howrah railway station to ship's hold. I suggest, however, that Government should allow the figures to undergo the criticism of commercial men in Calcutta before finally accepting them.

5. The quotation for No. 1 club a month ago was only 40*s.* 6*d.* a quarter; but as the trial transaction which I have described was followed by an offer of a large order at same price, it is presumed either that the quoted price in London had risen, or that the Calcutta dealers had found the advantage of buying thoroughly cleaned wheat.

6. I have no detailed information as to the price now ruling for each class of wheat; but a comparison of the following tables will show that the general run of prices of Indian wheat must be much the same as it was a month ago:—

A.—Prices quoted by a London wheat broker, dated 3rd August.

	s.	d.	
No. 1 club	44	0	per quarter of 492lbs.
No. 2 club	40	6	
Ordinary white	39	6 to 40*s.*	

B.—Prices quoted in Toulmin's Calcutta List, 29th August.

	Rs.	A.	
Jubbulpore (Club A., I.) ...	2	14	per maund of 82lbs.
Club No. 1	2	8	
Club No. 2	2	6	
Ordinary white	2	4	
Red wheat	2	0	

C.—The London price telegraphed on 12th September for Calcutta wheat was 38*s.* to 44*s.* per quarter.

List A shows the London prices of three classes of wheat.

List B is quoted to show the relative position of each class of wheat in Calcutta. The correctness of the Calcutta classification, *i.e.*, its actual correspondence with English classification, is open to doubt, as the wheat trade is practically a new one.

List C indicates, like list A, the London prices.

7. Here, then, we have a wheat classed at Cawnpore as club No. 2, fetching a price which appears to be equivalent to the price of the best class Indian wheat at home. It is, however, probable that the wheat, on account of its cleanness, may have been sold at the same price as the ordinary No. 1 club fetches in London; but even then it is difficult to understand how the transaction paid the Calcutta shippers.

The figures which I have given indicate sufficiently within what a very narrow limit transactions are being effected, and how easily profits will be destroyed by a small rise in the exchange rate, or in the price of wheat in India. The smallness of the margin for profits is confirmed by the first and third of the extracts quoted below (see portions marked *A*).

8. On consideration whether any official influence can be exerted for the promotion of the wheat trade, the only points of attack appear to be—

(1) the railway charge;
(2) the quality of wheat brought to market.

9. The charge from Cawnpore is 11 annas per maund, or about 25 per cent. on the final price. I cannot but think that Government influence might be used to reduce this charge. Owing to the low price of wheat in India, and the fall in exchange, something like 100,000 tons have been shipped between July 1st and July 30th of 1874-75 from Calcutta, against about 10 per cent. of the quantity in the three previous years; and as almost the whole of the Calcutta wheat must be brought by rail, it is apparently to the interests of the Railway authorities to prevent the trade from falling. The letters which I have quoted show on how very precarious a footing it now stands, and how important it is to give it more security. The price has been during the last year abnormally low, and a rise to the level of former years, or an advance in the exchange rate, must undoubtedly largely reduce exports from these Provinces, unless the Railway authorities will help to maintain them by a reduction in their charges. As it is, export from any tracts much north or west of Cawnpore (which are the largest wheat-producing tracts) is even now barred by the railway rates.

10. I suggest that a meeting of commercial men from Cawnpore and Calcutta and of Government and Railway officals should meet at Allahabad to consider, and as far as possible to settle, the question. If this suggestion is accepted, representatives of the Central Provinces Government (who are greatly interested in the matter) should be invited to attend, as well as officials belonging to the Great Indian Peninsula Railway.

11. The second point is the improvement of the quality of wheat. I believe that something may be effected by an improvement of seed in the North-Western Provinces. I have proposed experiments both with selected North-West and with Jubbulpore seed to be tried as an experiment this year in some of the Court of Wards' estates and on the Government farms.

12. It is a great object that wheat should be brought to market clean, and especially that it should be free from barley, which cannot by any machine be removed from wheat. Carelessness in sowing seed mixed with other seeds, and perhaps also in allowing grain to be mixed on the threshing-floor, are among the causes of the impurity of the grain brought for sale. I do not despair of making cultivators of the wheat-growing districts understand how much an adulteration with barley reduces the value of wheat for export. Means of communicating information exist in the kanungo and patwari staff.

The majority of cultivators are not brought into contact with European purchasers, and the banias who take their grain often mix it; so that the persons most concerned in the production of the pure grain do not learn by market experience what its value really is.

13. Shippers are now sending home much wheat which ought not to go. All Indian cultivators and dealers know that wheat not buried throughout the rains cannot escape the weevil, and they invariably bury their seed-grain for this reason. But much wheat has been bought for export which has not been buried, and which is therefore weevil-tainted, and will in consequence arrive in England half-dust. Indian wheat will, if this practice is continued, acquire, like Indian cotton, a worse name than it deserves.

14. In conclusion, I wish to bring to the notice of Government an error often made in wheat statistics, which tends to vitiate calculations. A quarter of wheat is assumed to be 480 lbs., whereas the wheat quarter of commerce is 492 lbs.

The following extracts have been kindly placed at my disposal by the persons to whom they were addressed :—

Extract from a letter received from a London general produce merchant, dated the 6th August.

Wheat.—The trade will possibly grow in importance, and a fair business may be done, provided Indian merchants are prepared to prosecute it under the conditions made necessary by the new order of things which have been brought about chiefly by the Suez Canal and telegraphs.

It is practically impossible to assure orders for wheat to be bought and shipped home on account of houses here; for there are so many speculators (the Greeks* and others) that are ready to make contracts for delivery in London at fixed prices, that the buyers naturally do not care to give orders which may or may not be executed, and in the rare cases when they do give orders, it is impracticable. Price limits.

The speculators above referred to do not really ship home the wheat at their own risk. They buy in the Indian market to-day, and sell in the home one to-morrow by telegraph, and *vice versâ*, thus making the

* The largest exporter from Cawnpore is a Greek.

business practically, if not in name, a commission one. But the original sellers are liable for allowances in the event of the grain turning out on arrival in London inferior to the standard sample sold by.

(*A*) The profit or commission, whichever it may be called, seldom, if ever, exceeds 5 per cent.; but at the same time it is not often that less than 2½ per cent. is cleared.

Extract from letter received from a London commission house, dated 30th July 1876.

(*A*) The broker through whom the bulk of the Indian wheats has been sold says that the shippers have come pretty well out of the business, having, as a rule, made from 2 to 5 per cent. on their sales. But, of course, he could not give me definite results of his client's business; for that would be a breach of confidence.

Extract from a letter from a London broker, dated 3rd August.

Replying to the remarks of your correspondent in the North-Western Provinces, you may tell him that the wheat trade *viâ* the Suez Canal and Cape will in all probability be considerable; and also that the quality that we have received from Cawnpore, Delhi, Meerut and Patna districts pleases our millers.

No. 36.] No. T.—40A., dated Camp Agra, the 27th April 1877.

From—E. C. Buck, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Offg. Secy. to Govt., North-Western Provinces and Oudh.

I have the honour to address you on the subject of the wheat trade with Europe in connection with the papers contained in Proceedings No. 1-42, dated 14th March 1877, Government of India, forwarded with your No. 446, dated the 24th March.

2. I am collecting the information required by the Government of India; but meanwhile I forward the following communication for the information of Government.

3. In my No. 884 A., dated the 11th December 1876, I submitted a note in which I traced the history of a consignment of wheat from Cawnpore to London. I showed, on what I believe to be true figures, that the margin of profits on exports of wheat was then very small, and that wheat bought at Cawnpore at Rs. 1-9-9 per maund must realise 44*s.* 1*d.* per quarter to cover expenses.

4. I apprehended (in my paragraph 7) that profits would be destroyed by a small rise in the exchange rate, or in the price of wheat in India. From enquiries I have made at Cawnpore and Agra, I believe that this has now occurred, and that in the North-Western Provinces the wheat trade is coming, or has come, to a standstill. Only 15,000 or 20,000 maunds of new wheat have been exported from Agra this year.

5. The prices for wheat laid down in Calcutta ranged last year (in April) from Rs. 2-3 to Rs. 2-5, and on the 26th April 1876 was Rs. 2-2-6 per maund: on the same date this year it is Rs. 3, exchange is now higher, and the local demand for money greater.

6. The rate quoted in the local markets is about 20 seers per rupee or Rs. 2 per maund, *i.e.*, 6 annas 3 pies dearer than last year, which,

reckoning exchange at last year's rate of 1*s.* 7½*d.*, adds about 7½*d.* per maund, or 3*s.* 6½*d.* per quarter to the price. I showed in my former letter that the price in England required to cover expenses was 44*s.* 1*d.* per quarter, when the price was Rs. 1-9-9 in Cawnpore. The price at home to meet a price of Rs. 2 must, therefore, be 44*s.* 1*d.* + 3*s.* 6½*d.*, or 47*s.* 7½*d.* at last year's exchange rates. Exchange is now about 1*s.* 9*d.*, or between 6 and 7 per cent. more unfavourable than before, which adds about 3*s.* to the price which must be realised at home, and brings the price up to 50*s.* 9½*d.*

7. Quotations at home were on the 20th April from 50*s.* to 56*s.* per quarter, which prices would appear to leave a margin.

8. But traders are met by the greatest difficulty of all in the tightness of the local money market, in which the rate is Rs. 2-4 at 51 days, or about 16 per cent. It has been nearly as high as this for some days. This rate swamps purchasers altogether.

9. What trade has been effected in wheat has been chiefly on the forward-purchase or time-bargain system, in which bargains have been made in anticipation of lower local prices. Much confusion is anticipated both at Cawnpore and Agra in consequence of native merchants being unable to fulfil their contracts.

10. There are only two ways in which Government can possibly give any present assistance to the home export trade,—

(1) by procuring the reduction of railway rates;

(2) by throwing money into the local market.

11. Railway rates are already low for large consignments, and I cannot say if it is possible for lower rates to be taken. I suggested some enquiry in this direction in paragraph 10 of my December letter.

12. How can Government throw money into the local market?—only, I presume, by allowing balances at out-treasuries to be freely utilised. Rabi kists are accumulating, and it may be possible to allow the Bank of Bengal to draw upon them.

13. The crop of new wheat is not well spoken of in Toulmin's Calcutta Circular, and it is quite true that (in canal-irrigated land especially) much of it suffered from over-wet. But the best wheat (between Agra and Delhi) is very good, and local traders at Agra are satisfied with it.

14. The excitement caused by the war telegrams was greatest some few days ago; and when the actual declaration of war was telegraphed, prices were declining, and at present show no signs of improvement.

15. I may add that I have this year received independent confirmation of the statement in the first letter quoted in my No. 884A. of 11th December 1876, that the trade was last year very much in the hands of Greeks who carried on business in wheat at what appeared to be unprofitable prices.

No. 37.] No. 899A., dated Naini Tal, the 21st May 1877.

From—C. ROBERTSON, Esq., Offg. Secy. to the Govt., North-Western Provinces and Oudh,

To—The Director, Agriculture and Commerce, N. W. P. & Oudh.

I am directed to acknowledge your letter No. T.—40 A., dated the 27th April last, regarding the wheat trade with Europe, and to request

that you will submit, as soon as possible, the report called for in G. O. No. 466A., dated the 24th March 1877.

No. 460, dated Lahore, the 8th April 1879.

From—LEPEL GRIFFIN, Esq., Secy. to the Govt. of the Punjab,

To—The Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce.

In continuation of my letter No. 666 of the 24th May 1878, I am desired to forward, for the information of the Government of India, the promised report on the wheat cultivation and trade of the Punjab, which has just been received from the Financial Commissioner, No. 147 of the 8th February.

2. The report is full, and scarcely calls for remark in passing it on; but I am to express the Hon'ble the Lieutenant-Governor's entire concurrence in what is stated in paragraph 22 in regard to the difficulty of improving the quality of grain exported, by careful sorting and cleaning before it leaves the interior of the country. This difficulty is also felt with reference to the adulteration of wheat mentioned in paragraph 24; for the rough way in which grain is carried and kept in India must prevent any careful separation of the grains of various kinds—and the more so, as the seed grain is seldom or ever pure.

No. 147, dated Lahore, the 8th February 1879.

From—J. A. E. MILLER, Esq., Secretary to Financial Commissioner, Punjab,

To—The Secretary to the Government of the Punjab.

Wheat cultivation and trade in the Punjab.

In compliance with the orders of the Government of India, communicated with your endorsement No. 325 of 27th March 1877, I am directed to submit the following report on the wheat cultivation and trade of the Punjab.

Samples already submitted.

2. The sample bags of wheat from all districts, called for by the Secretary of State, were duly forwarded to your office for transmission on 7th August 1877.

Manner in which the information was collected.

3. District officers were called on for reports in a circular, No. 2534 of 12th May 1877, of which a copy is enclosed. Information was called for on the heads contained in the Government of India Resolution in a tabular form prescribed by the Financial Commissioner.

Scope of the present report.

4. Paragraph 5, clause 13 of the Resolution, requires submission of a "General summary for the Province, showing the total area under wheat, the average outturn per acre, the total outturn, and the details of the import and export trade."

The following abstract shows the results on these points and on some others in a concise form. Some further details as to the four years previous to 1876-77, and as to rates of carriage, will be found in the more detailed statement at the end. The general remarks, including all other points not shown in the headings of the columns, have been thrown

together in continuous form, so as not to encumber the figured statements:—

Abstract.

District.	Area under wheat in 1876-77.	Average outturn per acre in maunds.	Total outturn.	Price per maund.	Total value of outturn.	Imports recorded in 1876-77 in maunds.	Exports recorded in 1876-77 in maunds.	Average consumption per head of population in lbs.	Total consumption in maunds of 80 lbs.	Surplus available for export and for seed.	Area under wheat in 1877-78.
1	2	3	4	5	6	7	8	9	10	11	12
	Acres.	Mds.		Rs. A. P.	Rs.			lbs.	Mds.		
Delhi	159,900	11·16	1,822,860	1 10 0	29,62,148	.....	.....	230	1,750,444	72,716	127,355
Gurgaon	132,425	1·020	1,986,375	2 0 7	40,45,170	300	72,000	139	1,198,272	788,403	122,708
Karnal	113,310	9·31	1,107,605	1 10 0	17,99,858	47,365	262,000	91·25	696,839	458,131	122,800
Hissar	39,048	7·0	273,336	1 11 0	4,61,155	369,111	152,762	45	272,633	369,814	36,365
Rohtak	99,428	11·1	1,096,194	1 14 9	21,06,873	142,123	132,477	225	1,510,197	.....	107,932
Sirsa	56,310	3·36	219,609	1 11 5	3,76,309	5,198	67,610	58	152,826	71,981	46,244
Umballa	296,322	8·14	2,474,289	1 7 0	35,56,790	4,363,374	1,706,598	312	4,038,403	2,799,260	349,446
Ludhiana	157,012	10·23	1,660,462	1 5 9·5	22,61,955	321,965	1,048,749	183	1,331,885	650,482	191,898
Simla	3,610	6·0	21,660	2 4 0	48,735	51,296	.....	222	94,336	.....	3,800
Jullundur	269,010	16·33	4,526,093	1 9 8	72,61,357	100,000	104,938	450	4,470,547	155,546	299,305
Hoshiarpur	346,437	8·21	2,953,375	1 5 0	38,76,305	63,264	122,823	274	3,230,702	.....	325,698
Kangra	144,170	6·33	983,960	1 12 5	17,47,554	20,329	49	108	1,004,240	49	132,496
Amritsar	263,265	13·0	3,422,445	1 10 8	57,04,075	569,510	302,334	183	1,404,916	2,587,039	276,069
Gurdaspur	197,000	10·6	1,999,550	1 8 1·81	30,18,175	1,000	15,000	152	1,721,639	278,911	209,100
Sialkot	325,529	11·26	3,792,413	1 6 0	52,14,568	28,800	259,000	274	3,442,139	379,074	356,208
Lahore	368,000	7·32	2,870,400	1 9 4	45,44,800	509,614	134,162	330	3,257,372	122,642	408,015
Gujranwala ...	203,745	9·27	1,971,233	1 8 8	30,38,984	260,200	169,000	266	1,830,665	400,768	222,256
Ferozepur	241,180	7·22	1,820,909	1 9 0	28,45,170	229,024	272,159	182	874,551	1,175,382	298,280
Rawalpindi	414,135	6·24	2,733,291	1 6 7	39,57,926	2,057,153	162,897	456	4,054,159	736,285	449,027
Jhelum	480,273	6·37	3,325,891	1 1 0	35,33,759	76,240	339,250	322	2,016,477	1,385,654	492,170
Guzerat	268,316	10·0	2,683,160	1 4 0	33,53,950	115,087	30,000	540	4,160,342	.....	306,946
Shahpur	179,325	9·35	1,770,834	1 7 0	25,45,574	306,834	70,000	365	1,682,632	395,036	185,074
Mooltan	186,040	9·12	1,730,172	1 13 1	34,69,948	559,815	152,587	365	2,151,506	138,511	236,122
Jhang	161,569	5·0	807,845	1 8 0	12,11,768	647,196	15,434	640	2,784,216	.....	159,502
Montgomery	263,494	15·9	4,011,696	1 9 0	65,19,006	18,800	311,575	540	2,426,199	1,603,497	208,561
Muzaffargarh ...	201,363	11·30	2,366,015	1 9 7·5	40,29,619	1,000	600,000	456	1,684,620	672,395	199,004
Dera Ismail Khan ...	250,000	8·20	2,175,000	1 7 0	33,98,438	.....	1,000,000	183	903,252	271,748	173,020
Dera Ghazi Khan ...	156,594	8·13	1,303,645	1 12 6	23,22,118	23,501	16,927	258	996,009	331,137	171,125
Bannu	262,728	6·30	1,773,414	1 3 0	21,05,929	30,400	155,598	300	1,078,301	725,513	296,645
Peshawar	232,975	6·0	1,397,850	1 15 5	27,44,737	18,648	12,932	182	1,190,171	226,327	254,143
Hazara	100,570	9·28	975,525	1 2 0	10,97,466	1,500	1,000	720	3,304,962	.....	121,058
Kohat	97,533	10·8	1,170,396	1 2 0	13,16,696	5,336	8,959	365	603,474	512,258	97,533
TOTAL ...	6,670,616	9·196	63,227,442	1 8 11·12	9,64,76,915	11,202,513	7,698,820	278·89	61,372,083	17,308,559	6,983,904

5. Some remarks must here be made as to the amount of reliance that may be placed on the information contained in these returns.

The reliability of the information considered.

6. The figures showing area under wheat for five years may be accepted as approximately correct. In districts which have been under settlement in the year under report they have been furnished by the settlement officers, and are exact for the year of settlement measurements: for the other years they are good estimates made by the settlement officer.

The area under wheat is approximately correct.

In other districts the figures should be exact for each year, as they are taken from the patwaris' annual papers. But though of late years successful efforts have been made to secure accuracy in these returns, there is still room for a great deal of improvement.

In the tables furnished for the Statistical Congress figures were given for the four years ending 1873-74. The area under wheat showed an increase from 5,302,473 in 1870-71 to 5,820,861 in 1873-74, the average for the four years being 5,551,794 acres. The area shown in the present returns for 1876-77 is 6,670,616 acres, being an increase of about one million of acres during the last three or four years.

The increase in area so cultivated is probable.

From the remarks in several of the local reports, there can be no doubt that some such increase has really taken place.*

7. The figures in paragraph 2 of the Government of India Resolution show that an enormous increase has taken place in the export of Indian wheat to Europe since the opening of the Suez Canal; and it is very natural that part of this increase should be due to exports from the Punjab, where the wheat crop already takes up about 30 per cent. of the total cultivated area of the Province.

The increased exports to Europe probably include too exports from the Punjab.

8. The next column, "Average outturn per acre," is one that cannot be accepted as showing uniformly correct results. Attempts have been made for many years to improve the statistics of outturn; and, though startling discrepancies are occasionally visible in district details, the general average arrived at is gradually becoming more trustworthy. The Statistical Congress figures showed that the average gross produce per acre, ascertained from numerous experiments, was 10 maunds 30 seers 1 chittack. The average shown in the present returns is somewhat less, being 9·196 maunds, or about 9 maunds 8 seers. The difference, however, is not very great. In some districts the yield appears to be put too low.

Average outturn doubtful.

In the case of Jhang the fact is evident; and Rawalpindi, Jhelum, Bannu, Peshawar, are also districts where the rate might be safely raised a little. But the average is recovered by the high yield taken for some districts, *e.g.*, Jullundur 16 maunds and Montgomery 15·9. Upon the whole, an average yield of 10 maunds per acre may be accepted as fair; and it must be remembered that this average amount

* The figures of area for 1877-78 have since been obtained and are shown in column 13 of the Abstract.

represents the yield of an acre of land when it is ready for division between the landlord and the cultivator. To ascertain roughly the annual outturn, all that is necessary is to multiply the ascertained area by ten.

The outturn of 1876-77 should, therefore, be 66,700,000 maunds. This may be taken as the maximum probable yield in a fair year unmarked by any noteworthy calamity of season.

The special enquiry made regarding the outturn of the spring crop of 1877 showed a total estimate of 41,727,733 maunds of wheat; to which remained to be added the figures of two districts not shown in the return, something over 2 million maunds. The total would, therefore, be about 44 million maunds. The yield of 1876, calculated at an average rate on the known area, is shown in the same return as 67 millions, or as nearly as possible the result above brought out. But there is reason to believe that the outturn of 1877 was much underestimated, owing to a sort of "famine panic" that prevailed when the enquiry was made.

Average wholesale price of wheat.

9. The next column the "average wholesale price of wheat per maund" ought to be correctly filled up, as the weekly Gazette price lists furnish complete materials. The provincial average of Rs. 1-8-11 per maund, or about 26 seers per rupee, is the result of adding up the district averages, and dividing by the number of districts.

This price, however, was what prevailed before famine rates set in in August 1877, and after a fair spring harvest. The average prices shown in the Revenue Report for 1875-76 and 1876-77 were—

1st June 1874	...	22·9 seers per rupee,
1st January 1875	...	25·1 „
1st June 1875	...	25·11 „
1st January 1876	...	23·1 „
1st June 1876	...	26·9 „
1st January 1877	...	28·7 „

whereas the prices of the autumn of 1877 were—

31st August	...	18½ seers.
30th September	...	15 seers 5 chtks.
31st October	...	15 seers.

This was the highest point reached. After November, when the full extent of the scarcity was known, and when a good spring harvest was looked forward to, prices became easier.

Average consumption per head of population.

10. The column showing "average consumption per head of population" contains entries not much to be relied on. It is impossible to state how much wheat is eaten by the people of any place, as they do not depend upon wheat alone for sustenance, nor even to anything like the extent, for instance, that the inhabitants of Bengal depend upon rice.

The best estimate is that which is based, not on any preconceived theory as to how much an individual can eat, but upon the known outturn and the known trade of the district, considered with reference to the population. Wheat is grown in all parts of the Punjab, and

especially in the central divisions, but barley and gram are also important spring crops; while jowar, bajra, Indian-corn and the inferior millets and pulses make up the bulk of the autumn crop, and furnish the food-supply of a large portion of the population, especially of the poorer classes. In the Punjab proper however, and particularly in the south and south-west, even the poorest people eat much wheat in the hot season. The estimated outturn being ascertained as above, and the amount exported out of the province being known with some approach to accuracy (from the trade returns), the balance should represent the consumption of the province, and the stock retained in hand; but a deduction must be made for seed-grain, for which from 30 to 40 seers per acre are required, and in some places more, where the sowing season is late and the soil poor. The average is perhaps a maund per acre. The calculation would accordingly stand thus :—

	Mds.
Outturn @ 10 maunds per acre	66,700,000
Exported	7,700,000
Remainder	59,000,000
Deduct seed @ 1 maund per acre	6,700,000
Remains for consumption	52,300,000
Add imports of districts	11,200,000
Available for consumption	63,500,000
Consumption shown in return	61,370,000
Difference	2,130,000

Somehow the difference here brought out is smaller than might have been expected, and would tend to show that the district estimates of export and consumption are not far from the truth; but this result is due rather to the setting-off of one error against another than to any great accuracy of details. The average consumption per head of the population of the province, ascertained by dividing the total consumption shown by districts over population shown by the census of 1868, comes to 279lbs. = 139 seers, or about 6 chittacks a day, which is not far short of the proverbial "half seer of ata" which is supposed to suffice for a poor man's wants: anything over this is presumably made up from consumption of other grains.

In some districts, however, the average per head is taken at a much lower rate, *e.g.*—

Hissar	45	lbs.
Sirsa	58	„
Karnal	91	„

while in others it is exceptionally high—

Jullundur	450	„
Rawalpindi	456	„
Guzerat	540	„
Jhang	640	„
Montgomery	540	„
Muzaffargarh	456	„
Hazara	720	„

In several instances the Deputy Commissioner boldly adopts the national standard of 365lbs., or half a seer a day per head.

In some cases where a high rate of consumption is reported the calculation is obviously incorrect. For instance, in Jhang the yield is taken at only 5 maunds per acre and seed at 1¼ maunds.

The outturn should therefore be	...	...	...	805,000
Add imports	...	...	...	650,000
				1,455,000
Deduct exports	...	...	...	15,000
				1,440,000
Deduct seed	...	...	...	200,000
leaves available	...	...	...	1,240,000
But the consumption comes to		...	...	2,780,000
showing a deficit of	...	...	...	1,540,000

and it is not explained how this deficit is supplied.

Similarly in Hazara the outturn comes to			...	900,000
and the consumption to		...	...	3,300,000

And as the imports and exports in this isolated district are very small, it remains to be explained where the difference required for consumption is obtained from. In such cases the rate assumed for consumption is evidently too high, especially as it includes women and children, and especially in cases where wheat is not the predominant crop of the district.

Upon the whole, it may be said that the local consumption is greatly overestimated in the district returns, as the result leaves little or no stock in hand, whereas the steadiness of prices in the face of a great drain for export to famine districts during the summer of 1877 shows that a large stock was in hand, being the surplus of more than one year.

Imports and exports of wheat.

11. The next columns showing imports and exports of five years are admitted to be mere guesses, on which no safe conclusions can be based. It is with difficulty that with the aid of a cordon of trade-registering posts, on which considerable expenditure is incurred, tolerable returns of import and export *across the borders* of the Punjab can be obtained. When it comes to a question of exports in and out of all the towns and villages of each district, these difficulties are enormously increased. Wheat is sent about in every direction, in all parts of India where it is grown, besides being sent to many parts where it is not grown at all. The important movements of the trade must therefore be considered from a much broader point of view than the local statistics of each district taken separately can afford. It is clear from the sea customs returns of Calcutta, Bombay and Kurrachee that large quantities of wheat leave India annually, and that the trade with Europe is rapidly expanding. It is also well known that during the Bengal famine of 1874 a large supply of wheat was sent from the Punjab, the average export of the years 1873-74 and 1874-75 being 9¼ millions of

maunds (total exports as shown in these returns), whereas, even with the high price of wheat in Europe, in 1876-77 the total export was only 7¾ millions of maunds. This seems to show that a heavy Indian demand for wheat, such as existed during the Bengal famine, and again during the Bombay and Madras famines, has a more telling (though temporary) effect on the trade than any change in the distant European market can have.

Effect of export trade in developing the cultivation of wheat in the Punjab.

12. It is probable that any sudden extra demand for export is met chiefly by drawing on the surplus stores of the province in hand from previous years; but it may also be met to some extent by a decreased local consumption, consequent on the rise in price which a demand for export causes. It is mentioned by the Deputy Commissioner, Mooltan, that it is not uncommon for grain to be sent to Mooltan from northern districts and kept there for two years or so, to wait for a favourable market. The same thing probably occurs in other large towns. For many years past there has been no want of stimulus to the cultivation of wheat in the Punjab; the profit of the crop, and in consequence the area of its cultivation, has been increasing steadily. But a steady and permanent demand in Europe for Indian wheat at remunerative prices would undoubtedly tend to gradually increase still further the production of wheat in the Punjab, and has perhaps already to some small extent done so. The opening of the Suez Canal having revolutionised the trade between the East and the West, and having opened the eyes of European merchants to the capabilities of British India, the new source of wealth thus created for Indian agriculturists, and especially for wheat-growers, should be of vast benefit to the country; provided that the cultivation increases with the increase of demand, and that the exports do not reduce the stocks in hand dangerously, and do not raise prices to a degree oppressive to the poorer classes.

The reason why exports of wheat from large towns cannot be accurately ascertained.

13. It might be expected that the returns of the grain trade in large towns would be more reliable than those of the interior of districts or of posts on trade routes. But it will be found that in consequence of an octroi duty being levied by most municipalities on grain, the returns of imports show a larger excess over exports than the consumption of the towns would justify, the fact being that it is more necessary to record the imports correctly than the exports, as there is no octroi duty on exports.

More accurate information regarding wheat trade obtained from the annual trade reports.

14. The general conclusion is that, though some interesting facts regarding local trade are mentioned in the district reports, information regarding the imports and exports of wheat of the Province, as a whole, can be better obtained from returns of external trade in the Annual Trade Reports issued by this office.

Export wheat trade by the Indus.

15. The Trade Report for 1876-77 shows that the export of wheat by the Indus route was as follows:—

1874-75.	1875-76.	1876-77.
Mds.	Mds.	Mds.
303,911	423,853	595,153

The greater part of the export* to Europe must have gone by this route. But the returns show that, in 1876-77, 258,287 maunds were also exported in the direction of the North-Western Provinces, which may have included some exports to Europe *viâ* Calcutta; but that this is not the natural route for such export is shown by the fact that in the previous year 1875-76 there were only 36,844 maunds sent that way, whereas in 1874-75 there was an export of 1,000,345 maunds, chiefly on account of the Bengal famine. The export of 595,153 maunds in 1876-77 (to Sind) is valued in the trade returns at Rs. 12,07,714, or about 20 seers for the rupee. The export was then almost entirely by country boats.

Difference between exports and quantity available for that purpose.

16. The total export of wheat in all directions was 1,140,011 maunds, although the return compiled for the present report shows that 17,308,559 maunds were available for export. This may be held to mean either that this surplus of the produce of districts was available for the supply of other districts in the Punjab, or, more probably, that this quantity, after deducting the small proportion exported to Sind, was available for storage in the Punjab to meet future demands.

During the summer of 1877 the price of grain in the Punjab rose to such an extent, that it was no longer remunerative to export wheat to Europe. It became necessary to draw largely on this supply for the subsistence of the Province and for export to the famine districts of Madras and Bombay.

Exports during 1877.

17. The trade returns having been completed for the three quarters from 1st April to 31st December 1877, the following abstract has been prepared, showing the export of wheat from the Punjab during that period :—

Statement showing the quantities (in maunds) of wheat exported across the Punjab Frontier from 1st January to 31st December 1877.

1	2	3	4	5	6	7
Countries and Provinces.	From 1st January to 31st March 1877.	From 1st April to 30th June 1877.	From 1st July to 30th September 1877.	From 1st October to 31st December 1877.	Total.	Remarks.
	Mds.	Mds.	Mds.	Mds.	Mds.	
Kashmir	26,293	17,704	31,490	50,203	125,690	(a) Includes exports of wheat by the Rajputana State Railway across the frontier, from 1st April 1877 to 31st March 1878.
Ladakh	...	530	...	...	530	
Chinese Tibet ...	...	68	...	...	68	
Bajaur	3,443	3,609	656	1,360	9,068	
Kabul	5,348	7,239	2,700	4,981	20,268	
Tirah	622	219	636	332	1,809	
Sewestan	1,245	3,310	3,154	2,294	10,003	
North-Western Provinces	104,368	650,930	460,427	181,806	1,397,531	
Sind	155,662	325,908	604,532	188,709	1,274,811	
Bahawalpur	36	36,343	28,348	2,072	66,799	
Bikanir	8,481	8,431	18,275	23,231	58,418	
Rajputana	7,602	(a)5,951	(a)36,615	(a)30,077	81,145	
TOTAL ...	313,100	1,060,242	1,186,833	485,965	3,046,140	

* *Note.*—The Trade Report for 1877-78, since issued, shows that the export in that year had risen to 1,305,675 maunds.

Kashmir.

Owing to scarcity in Kashmir, a considerable quantity of grain was exported into that State from neighbouring Punjab districts; the export reached its height in January to March 1878.

North-Western Provinces and Sind.

The export to the North-Western Provinces was very active in the spring and early summer, owing probably to the scarcity and high prices in those Provinces. But as the year went on, this export decreased, while the export down the Indus increased during the summer months, July to September, partly because the rivers are then at their highest, and partly because of the demand for grain in the famine districts of Bombay and Madras. As the cold season approached, the export decreased. The total export during these nine months of 1877 was 2,663,089 maunds, of which 1,119,149 maunds was by the Indus route.

Information is not at present available as to how much of this export was to Europe. The returns of the Kurrachee custom-house will show this; but the probability is that most of this wheat was consumed in the famine districts, as it must have been bought at too high a price for profitable export to Europe.

Exports during 1878.

18. Since these remarks were written, further figures have been obtained showing the exports of wheat in each quarter from 1st January 1878 to 30th September 1878, of which a statement is here given.

Statement showing the quantities (in maunds) of wheat exported across the Punjab Frontier from 1st January to 30th September 1878, by quarters.

1	2	3	4	5	6
Countries and Provinces.	From 1st January to 31st March 1878.	From 1st April to 30th June 1878.	From 1st July to 30th September 1878.	Total.	Remarks.
	Mds.	Mds.	Mds.	Mds.	
Kashmir	106,614	39,999	46,538	193,151	
Ladakh	...	110	...	110	
Chinese Tibet ...	...	1,079	...	1,079	
Bajaur	2,081	1,592	3,178	6,851	
Kabul	4,419	1,861	8,219	14,499	
Tirah	158	470	4,326	4,954	
Sewestan	2,178	4,138	8,804	15,120	
North-Western Provinces	122,020	76,308	40,354	239,582	
Sind	180,526	256,754	*361,528	804,808	* Does not include the exports of wheat by the Sind Punjab Steam Flotilla for the quarter ending 30th September 1878.
Bahawalpur ...	2,293	655	790	3,738	
Bikanir	11,010	15,260	1,942	28,812	
Rajputana	†16,444	15,285	18,353	50,082	† Includes exports of wheat by the Rajputana State Railway across the frontier from 1st April 1877 to 31st March 1878.
TOTAL ...	455,243	413,511	494,032	1,362,786	

19. Taking the two periods from 1st January to 30th September in the two years 1877 and 1878, we find that there was a decrease of exports from 2,560,175 maunds to 1,362,786 maunds, the falling-off being entirely in the summer months, April to September; an increase in the winter months, January, February and March, being caused by exports to Kashmir.

Fluctuations in exports during 1877 and 1878.

The decrease in the summer was chiefly in the exports to the North-Western Provinces, which fell from 1,111,357 maunds to 116,662 maunds; the exports to Sind (Kurrachee) also from 930,440 to 618,282 maunds.

20. The large exports in the summer of 1877 across the North-Western Provinces frontier and towards Sind were evidently caused by the famine in Bombay; but the export received a sudden check in the last quarter of 1877, owing to the failure of the autumn harvest in the Punjab and the rise in prices.

Probable causes of such fluctuation.

In 1878 the export towards Kurrachee again rose, until it reached 361,528 maunds in the third quarter (ending 30th September 1878), exclusive of the returns of the Sind-Punjab Steam Flotilla which had not been received. Of the 900,000 maunds exported by the Punjab during the six months ending 30th September 1878, fully two-thirds went to Sind. This is no doubt owing partly to the increased facilities for export afforded by the Indus Valley State Railway, and it shows that this route will in future be the main outlet for the surplus grain of the Punjab, much of which will find its way to Europe. The rapid development of this export trade is the more remarkable when it is remembered that prices of food-grains were very high during that period. It is probable that much of this wheat was bought when prices were lower.

21. The estimation in which Indian wheat is held in Italy is shown in the following extract from a report by the British Consul at Genoa for the year 1876:—

Estimate of Indian wheat in Europe.

"One consequence of the high prices was, that several parcels of soft wheat from India were disposed of at advantageous terms, selling higher here than they would in Marseilles or London, *viz.*, at 10*s.* 6*d.* per 100 lbs., English cost and freight by steamer. One of the most intelligent grain merchants here tells me that this wheat found ready sale, and was much appreciated, and would be yet more so if the producers would take more care in preparing it for market, to separate it from the hard wheat, which detracts greatly from the appearance of the flour when it comes from the mill."

22. In connection with this part of the subject, it is necessary to allude to the "Rules for inspection of grain in the United States," of which copies were received from Government for information in September 1877. The object of these rules is stated to be "to ensure the delivery of wheat and other food-grains of defined qualities to purchasers at shipping ports." This is

Improvement of quality of the grain exported by sorting and cleaning.

effected by a system of inspection and the issue of certificates declaring the quantity and quality of the grain. Such a system is doubtless very useful in a highly civilised commercial community; but it is difficult to see in what way it could be worked in the interior of India. It is a matter for the consideration rather of the Chambers of Commerce at Bombay, Kurrachee and Calcutta than for the revenue authorities in the interior, because grain can only be conveniently inspected after it has been gathered together and sent down to the shipping ports. Something might be done by the merchants at those ports to establish standards of grain and to disseminate information as to the qualities, on which difference in price chiefly depends. In course of time exporters in the interior would come to know that certain kinds of grain or certain modes of treatment would ensure higher prices at the shipping ports. But as long as the local producers can obtain what they consider a remunerative price without taking any trouble in the way of separating wheat from other grain, of "hard wheat" from "soft wheat," it is not likely that any great improvement will be effected in their habits in this respect.

When the trade in grain has reached a steady limit, and a profit is only to be made by effecting an improvement in quality by careful treatment, these artistic systems may be useful. But the fact is, that the greatest activity in the grain trade shows itself in times of famine and panic, when the great demand is for edible grain, no matter of what kind or quality; and at such a time any little defects of sorting and cleaning are readily overlooked. The past year or two therefore have been an unfavourable period for forming any judgment as to the real requirements of the wheat cultivation and trade. The conditions of the subject have been rendered quite abnormal by the occurrence of the famines in various parts of India, and latterly also by the uncertain state of affairs in Europe. When these exceptional conditions cease to exercise a disturbing influence, the prospects of the grain trade between India and Europe *viâ* the Suez Canal will be more clearly discernible. There can, however, be no doubt that in the absence of disturbing causes, and to some extent in spite of such causes, there is a tendency towards a rapid development of the trade between Indian and Mediterranean ports. This is specially evinced by the increase of the trade between India and Italy, which is shown in the Statistical Abstract of British India, 1877, No. 11, pages 48-49, and in the Annual Statements of Trade of British India up to 31st March 1877, Part II (pages 4-5 of the Abstract tables), to have been as follows for the years ending 31st March :—

	1872.	1873.	1874.	1875.	1876.	1877.
	£	£	£	£	£	£
Imports from Italy to India	114,488	146,924	338,995	279,865	526,825	1,365,779
Exports from India to Italy	134,183	954,074	1,319,579	1,112,191	1,223,814	1,410,405

This trade may be said to be a new creation, due to the opening of the Suez Canal. Much of this export trade must consist of food-grains. The falling-off in 1875 corresponds to a falling-off in the export of food-grains generally from India to other countries, and is probably due to the Bengal famine.

Inland cost of carriage.

23. The cost of carriage from the producing district to the shipping port is one of the subjects on which information is required.

The communications of the Punjab consist of the railway system with its centre at Lahore extending westwards to Jhelum, southwards to Mooltan,* and south-eastwards to Delhi and Calcutta; the Grand Trunk Road running from Peshawar to Delhi; and the river system converging in the Indus leading to Kurrachee. For purposes of short local traffic, the roads and rivers are used; but for through traffic the railway has of late years superseded all other means of land carriage, though where the direction of trade is down a river water carriage is still largely employed, as it is cheap and convenient, though exposed to risk of occasional loss of boats and to great delay. From the neighbourhood of Delhi wheat can be sent by railway to Calcutta for Re. 0-14 a maund, and to Bombay for Rs. 1-3-6. From the Sirsa district the Sutlej route is available; and wheat can be sent from Fazilka to Kurrachee by boat for Rs. 1-2 per maund. From Umballa the cost of carriage to Kurrachee is stated to be Re. 0-15-11 per maund, partly by railway. From Ludhiana the Calcutta route and the Kurrachee route appear to cost the same—Rs. 1-4 per maund; the Bombay route costing Rs. 1-10. Further up the line the cost of the Calcutta route is greater than the Kurrachee route. At Ferozepur, which is a great place for grain trade, the cost is Re. 0-12 per maund to Kurrachee, Rs. 1-4-3 to Calcutta, and Rs. 1-9-9 to Bombay.

In the western districts the Indus route has the advantage, and large exports are made by boat to Kurrachee at a cost of Rs. 1-4 to Rs. 1-8 per maund. The Deputy Commissioner of Mooltan gives the details of carriage by rail, by steamer and by boat, from which it appears that the steamer route costs only Rs. 1-6-1, whereas boat carriage costs Rs. 1-10-1 to Kurrachee; but, notwithstanding this difference, boat carriage is preferred by native merchants. Upon the whole, it appears that Kurrachee is the natural outlet for the grain trade of the Punjab with Europe; and as this route is gradually developed, it will probably attract the bulk of the export trade. The route by rail to Bombay *viâ* Allahabad is necessarily more expensive than either of the others. But the Calcutta route may, as in the case of the cotton trade, continue to attract a good deal of the trade of the eastern districts.

As a through route to Europe, the Kurrachee route is superior to all others; but, apart from the export trade to Europe, there is always a great deal of inland trade in grain, for which the Calcutta and Bombay lines of Railway will always be employed.

Adulteration of wheat.

24. The admixture of grain with other kinds is alluded to in the Government of India Resolution as one of the difficulties to be overcome. It is remarked

* The line has since been opened to Kurrachee.

that "it is not probable that the adulteration is altogether fraudulent." It is not stated whether the mixture of inferior grains has been especially complained of in the case of Punjab wheat; but it is probable that the Punjab wheat is no better in this respect than the other kinds of Indian wheat that find their way to Europe. The same difficulty has been found in obtaining sound and clean supplies of barley for the Commissariat. Native growers, having but small space at their command for the storage of grain, allow the different kinds to get mixed up in a careless manner. This is so common a practice, that the various mixtures have distinctive names. The seed sown from these mixed supplies perpetuates the mixed crop.

Besides this, the natives seem in some parts of the country to prefer a mixed crop of wheat and barley, or wheat and gram, to a pure crop of any one of these. Not being both dependent on precisely the same conditions of soil and weather, there is always a chance that if one fails, the other will succeed. There is nothing fraudulent either in the cultivation of the mixed crop, or in the sale of the mixed grain. It is simply one of those customs of the country regarding which it is difficult to get the natives to take the same view as ourselves.

Whether in the Punjab the "agricultural community will be ready to modify this habit on becoming acquainted with the facts of the case" remains to be seen. The most tangible fact that could appeal to them would be the better price obtainable for good grain than for bad. But this is an advantage that can be more readily seized by the merchants at the shipping ports, who have the opportunity of sorting and cleaning grain on a large scale, than by the local producer, who will for a long time to come be content to make over his grain to the village dealer just as it comes from his field.

Conclusion.

25. The cultivation of wheat is tolerably well understood by the cultivators of the Punjab. The soil and climate of the province seem well adapted to the crop; and with the certainty of a good demand at all times for Punjab wheat, whether for consumption in India or for export to other countries, there seems every probability that the cultivation will continue not only to hold its present important place, but to expand from year to year.

In the local reports annexed to this summary will be found much interesting information regarding methods of cultivation and kinds of wheat in different districts.

Note.—This report was originally prepared early in 1878 on the figures for the period ending 1876-77; but as its submission has been delayed, the opportunity has been taken to add at paragraphs 18 *et seq.* statistics of trade as far as available up to September 1878, and a column showing the area under crop in 1877-78 from the Revenue Report of that year, since printed.

The local reports and statistics, however, have been left as originally received.

The prospects of the wheat harvest of 1878-79 are not at present favourable, and the price of wheat is rising.

Statement giving particulars regarding

Division.	District.	Area (in acres) under wheat in 1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Average outturn per acre in maunds of 80 lbs.	Average wholesale price of wheat per maund of 80 lbs. Rs. A. P.	Average consumption per head of population of the district in lbs.	Total consumption within the district in maunds of 80 lbs.	Annual imports 1872-73.	1873-74.
Delhi.	Delhi ...	102,329	108,332	105,956	157,000	150,900	11·16	1 10 0	230	1,750,444	...	...
	Gurgaon ...	74,034	123,469	99,852	158,890	132,425	10·20	2 0 7	139	1,198,272	400	400
	Karnal ...	129,410	99,874	98,275	125,440	113,310	9·31	1 10 0	91·25	696,839	29,800	41,700
	Total ...	305,773	331,675	304,083	441,330	405,635	10·086	1 12 2·33	157·98	3,645,555	30,200	42,100
Hissar.	Hissar ...	39,769	45,300	47,853	36,265	39,048	7·0	1 11 0	45	272,633	441,710	416,151
	Rohtak ...	126,262	122,644	125,833	108,167	99,428	11·1	1 14 9	225	1,510,197	232,778	212,847
	Sirsa ...	33,480	37,287	42,970	48,791	56,310	3·36	1 11 5	58	152,826	7,410	5,692
	Total ...	199,511	205,231	216,656	193,213	194,786	9·032	1 12 4·66	125·20	1,928,813	681,998	634,690
Umballa.	Umballa ...	246,491	221,752	256,729	275,456	296,322	8·14	1 7 0	312	4,038,403	4,421,400	5,058,200
	Ludhiana ...	192,692	199,606	202,783	183,838	157,012	10·23	1 5 9·5	183	1,331,885	822,011	323,974
	Simla ...	3,000	3,000	2,500	3,221	3,610	6·0	2 4 0	222	94,336	31,327	39,516
	Total ...	441,183	424,358	462,012	462,515	456,944	9·096	1 10 11·16	264·51	5,464,624	5,274,738	5,421,690
Jullundur.	Jullundur ...	307,831	308,314	315,128	264,866	269,010	16·33	1 9 8	450	4,470,547	80,000	50,000
	Hoshiarpur ...	343,096	309,011	311,794	321,337	346,437	8·21	1 5 0	274	3,230,702	30,515	94,700
	Kangra ...	110,080	119,920	122,035	127,528	144,170	6·33	1 12 5	108	1,004,210	253,404	126,283
	Total ...	761,007	737,245	748,957	713,731	759,617	11·142	1 9 0·33	280·17	8,705,489	363,919	270,983
Amritsar.	Amritsar ...	247,881	256,578	279,899	255,818	263,265	13·0	1 10 8	183	1,404,916	...	...
	Gurdaspur ...	163,930	168,964	174,669	196,142	197,000	10·6	1 8 1·81	152	1,721,639	30,000	15,000
	Sialkot ...	404,775	412,265	377,764	326,788	325,529	11·26	1 6 0	274	3,442,139	246,000	295,000
	Total ...	816,586	837,807	832,332	778,748	785,794	11·726	1 8 3·27	191·52	6,568,694	276,000	310,000
Lahore.	Lahore ...	193,029	233,108	217,734	258,480	368,000	7·32	1 9 4	330	3,257,372	485,401	154,153
	Gujranwala ...	162,199	169,178	180,172	187,015	203,745	9·27	1 8 8	266	1,830,605	242,200	240,200
	Ferozepur ...	186,696	201,033	198,288	208,763	241,180	7·22	1 9 0	182	874,581	204,560	239,367
	Total ...	541,924	603,319	596,194	654,258	812,925	8·197	1 9 0	252·45	5,962,588	932,161	633,725

Wheat cultivation in the Punjab.

IN MAUNDS OF 80 LBS.			ANNUAL EXPORTS IN MAUNDS OF 80 LBS.					Estimated average cost of cartage or other conveyance from head-quarters of districts not situated on a line of railway to the nearest railway station.	Cost of transit to port of shipment (Calcutta, Bombay, or Kurrachee), by rail, by road and by river, i.e., by the route usually adopted.
1874-75.	1875-76.	1876-77.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.		
324,402	715,063	...	...	594,788	981,224	29,906	...	Situated on line of railway.	To Calcutta Re. 0-14, to Bombay Rs. 1-3-6, per maund.
500	600	300	36,000	27,200	35,000	29,900	72,000	Situated on line of railway.	To Calcutta Re. 0-14-1, to Bombay Rs. 1-3-8, per maund.
24,550	22,485	47,365	264,000	250,000	265,000	252,000	262,000	2 annas per md.	Not known: no rail in this district.
349,452	738,148	47,665	300,000	871,988	1,281,724	311,806	334,000		
485,877	465,579	369,111	170,946	99,053	95,920	104,659	152,762	4 annas per md.	
198,633	170,000	142,123	105,600	129,000	126,400	110,325	132,477	2 annas 6 pie per maund.	
8,233	6,586	5,198	49,791	58,088	51,016	48,566	67,610	7 annas per maund to Okara railway station.	Rs. 1-2 per maund by the river Satlej from Fazilka to Kurrachee.
692,743	642,165	516,432	326,337	286,141	273,336	263,550	352,849		
4,453,200	349,000	4,363,374	1,120,000	3,410,000	1,132,000	2,434,000	1,706,598	Re. 0-2-1¼ per maund.	Umballa to Bombay Rs. 1-5-1½, to Calcutta Re. 0-15-6¼, to Kurrachee Re. 0-15-11 by railway, per md.
2,118,913	1,016,900	321,965	1,426,663	1,161,221	3,413,499	1,590,965	1,048,749	2 pie per maund.	To Calcutta Re. 0-1-4, to Bombay Re. 0-1-10, to Kurrachee Re. 0-1-4 per maund.
40,220	38,036	51,296	...	...	...	...	...	.....	
6,612,333	1,403,936	4,736,635	2,546,663	4,571,221	4,545,499	4,024,965	2,755,347		
75,000	75,000	100,000	118,100	201,200	152,292	80,555	104,938	.....	To Calcutta Rs. 1-1-1·44 per maund.
49,383	55,624	63,264	102,727	99,620	116,505	112,916	122,823	Re. 1 per md.	To Calcutta Rs. 1-2, to Bombay Rs. 1-7, to Kurrachee Rs. 1-2.
171,425	134,451	20,329	466	496	73	589	49	Re. 1 per md.	To Calcutta Rs. 1-2, to Bombay Rs. 1-7, to Kurrachee Rs. 1-2.
295,808	265,081	183,593	221,287	291,316	268,870	194,060	227,810		
556,512	561,827	569,510	248,588	231,320	279,470	282,424	302,334	.....	Not known.
20,000	1,000	1,000	3,000	2,000	2,000	10,000	15,000	Re. 0-2-6·72 per maund.	
355,000	326,000	288,000	176,000	221,000	219,000	252,000	259,000	Re. 0-1-9 per maund.	
931,512	888,827	858,510	427,588	454,320	500,470	544,424	576,334		
494,906	462,757	509,614	93,999	77,309	123,312	121,888	134,162	.....	To Calcutta Rs. 1-2-6, to Bombay Rs. 1-8, to Kurrachee Re. 0-14-6.
263,200	259,200	260,200	110,000	174,000	188,000	222,000	169,000	Situated on railway line.	No exports to any port of shipment. Some wheat goes to Lahore by rail and carts. From Wazirabad goes by boat to Mooltan.
181,288	75,247	229,024	101,282	142,688	41,475	116,043	272,159	2 annas per md.	To Calcutta Rs. 1-4-3, to Bombay Rs. 1-9-9, to Kurrachee Re. 0-12-0 by river.
939,394	797,204	998,838	305,281	393,997	352,787	459,931	575,321		

Statement giving particulars regarding

Division.	District.	Area (in acres) under wheat in 1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	Average outturn per acre in maunds of 80 lbs.	Average wholesale price of wheat per maund of 80 lbs.	Average consumption per head of population of the district, in lbs.	Total consumption within the district in maunds of 80 lbs.	Annual imports 1872-73.	1873-74.
								Rs. A. P.				
Rawalpindi.	Rawalpindi	324,286	337,018	350,774	392,772	414,135	6·24	1 6 7	456	4,054,159	1,057,708	980,037
	Jhelum ...	355,589	393,880	430,603	408,140	480,273	6·37	1 1 0	322	2,016,477	36,000	40,000
	Guzerat ...	223,642	218,757	232,729	260,621	268,316	10·0	1 4 0	540	4,160,342	125,000	110,000
	Shahpur ...	124,536	134,236	158,678	168,650	170,325	9·35	1 7 0	365	1,682,632	299,200	297,346
	Total ...	1,028,053	1,083,900	1,172,784	1,230,183	1,342,049	7·834	1 4 10·33	433·71	11,913,610	1,517,908	1,436,383
Multan.	Mooltan ...	176,948	171,830	169,281	189,027	186,040	9·12	1 13 1	365	2,151,606	568,783	614,403
	Jhang ...	143,764	153,982	140,852	145,780	161,569	5·0	1 8 0	640	2,784,216	668,276	705,576
	Montgomery	162,989	189,709	193,332	190,692	263,494	15·9	1 9 0	540	2,426,199	32,750	22,350
	Muzaffargarh	186,240	188,548	187,115	203,215	201,363	11·30	1 9 7½	456	1,684,620	1,100	1,200
	Total ...	669,941	704,069	719,579	728,714	812,466	10·974	1 9 11·13	490·80	9,046,541	1,270,909	1,343,619
Derajat.	Dera Ismail Khan.	250,000	250,000	250,000	250,000	250,000	8·20	1 7 0	183	903,252	...	...
	Dera Ghazi Khan.	89,584	111,048	108,060	165,807	156,594	8·13	1 12 6	258	996,009	...	...
	Bannu ...	169,505	184,313	293,695	263,620	262,728	6·30	1 3 0	300	1,078,301	10,400	12,375
	Total ...	509,089	545,361	652,355	679,487	669,322	7·772	1 7 6	240·31	2,977,562	10,400	12,375
Peshawar.	Peshawar ...	319,324	320,525	310,296	269,040	232,075	6·0	1 15 5	182	1,190,171	6,102	750
	Hazara ...	91,320	91,320	91,320	91,533	100,570	9·28	1 2 0	720	3,304,962	3,000	5,000
	Kohat ...	32,113	36,600	40,300	94,340	97,533	10·8	1 2 0	365	663,474	5,366	4,546
	Total ...	442,757	448,445	441,916	455,513	431,078	8·223	1 6 5·66	318·43	5,158,607	14,558	10,305
	Grand Total	5,715,824	5,921,410	6,146,868	6,337,720	6,670,016	9·196	1 8 11·12	278·89	61,372,083	10,372,691	10,116,069

Wheat cultivation in the Punjab—concluded.

IN MAUNDS OF 80 LBS.			ANNUAL EXPORTS IN MAUNDS OF 80 LBS.					Estimated average cost of cartage or other conveyance from head-quarters of districts not situated on a line of railway to the nearest railway station.	Cost of transit to port of shipment (Calcutta, Bombay or Kurrachee) by rail, by road and by river, i.e., by the route usually adopted.
1874-75.	1875-76.	1876-77.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.		
1,651,548	1,599,362	2,057,153	87,208	148,526	162,394	180,382	162,897	4 annas per md.	*Nil.*
55,858	59,196	76,240	46,946	338,560	331,613	310,390	339,250	On line of rail	To Calcutta Rs. 2-5-7, to Kurrachee Rs. 1-4, per maund by river.
144,692	71,153	115,087	22,000	310,000	8,060	7,100	30,000	On line of rail	*Nil.*
290,795	296,934	306,834	44,000	35,000	50,000	48,000	70,000	5 annas per md., Guzerat distant 101 miles.	Rs. 1-8 per maund to Kurrachee by river.
2,142,893	2,020,645	2,555,314	200,154	832,086	552,067	545,872	602,147		
605,688	618,453	559,945	200,275	138,038	176,640	138,385	152,587	On line of rail	*By rail.* To Calcutta Rs. 1-6-3, to Bombay Rs. 1-11.
								By River. To Sher Shah by rail ...	*Steamer.* Rs. A. P. 0 6 0 — *Boat.* Rs. A. P. 0 0 0
								To Bunderghat by canal ...	0 0 0 — 0 0 6
								Sher Shah to Kotri by steamer ...	0 13 0 — 0 0 0
								Bunderghat to Kotri by boat ...	0 0 0 — 1 0 0
								Kotri to Kurrachee by rail ...	0 2 7 — 0 2 7
								Kurrachee to Bombay by steamer ...	0 6 0 — 0 0 0
									1 6 1 — 1 10 0
693,990	760,344	647,196	5,200	9,300	8,200	14,550	15,434	...	
19,500	19,000	18,000	100,000	150,000	100,000	150,000	311,575	On line of rail	*By rail.*—To Bombay Rs. 1-9-2, to Sher Shah Re. 0-2-9, to Calcutta Rs. 1-4, to Kurrachee Rs. 1-2-4, to Lahore Re. 0-2. *By road.*—To Shahpur Re. 0-8, to Jhang Re. 0-4, to Jhelum Re. 0-8, to Gujranwala Re. 0-5.
800	950	1,100	339,500	208,477	47,577	572,865	600,000	Re. 0-1-6 per md.	Rs. 1-8.
1,319,978	1,398,747	1,226,141	644,975	505,815	832,417	875,800	1,079,596		
...	...	...	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	Re. 0-6-6 per md.	To Sukkur by boat Re. 0-12, to Kurrachee by boat Rs. 1-10.
52,141	39,001	23,501	...	...	30,228	14,585	16,927		To Sukkur by river Re. 0-11-6 per maund.
25,380	23,405	30,400	104,351	104,440	108,478	163,337	155,598		
77,421	62,406	53,901	1,104,351	1,104,440	1,138,696	1,177,922	1,172,525		
37,047	38,875	18,648	607	211	13	14,692	12,932	Re. 0-11-6 per maund.	
2,000	10,000	1,500	2,000	1,500	3,500	2,800	1,000	To Jhelum Re. 1 per maund.	
6,555	4,274	5,336	19,538	18,348	19,181	9,949	8,959	There is no railway station nearer than Jhelum; grain is not exported thither, but to Peshawar.	To Kurrachee by river Indus 2 annas per 100 maunds per mile.
45,602	53,149	25,484	22,145	20,059	22,694	27,441	22,891		
13,407,136	8,276,308	11,202,513	6,098,781	9,331,383	9,268,560	8,425,801	7,698,820		

Remarks regarding Wheat cultivation in the Punjab.

Delhi.—Wheat is grown as a rabi or spring crop on land irrigated from wells (chahi) or from the canal (nahri). It is also grown on barani or unirrigated land; but on such land barley is a more common crop. Wheat flourishes best on dakar and rousli soils. The former is a rich, dark loamy tenacious soil, subject to submersion or inundation; and the latter is a fine, light, mouldy soil. The land is ploughed six or eight times between June and October, and the seed is sown towards the end of the latter month. The land on which wheat is grown is manured every third year or so. The crop ripens in April. About 96lbs. of seed is sown to the acre. If seasonable rain falls in January, a good crop may be anticipated, and one or two waterings will be sufficient; but if the rains are scanty and unseasonable, four or five waterings will be required. Wheat is sometimes grown on dofasli land which has produced a kharif crop; but the yield in such cases is not abundant. The most usual practice is to let the land lie fallow after a kharif crop of jowar or bajra, and sow wheat the following year. Wheat is rarely sown in the same field two years in succession. An interval of one or two years is allowed, during which a kharif crop is taken off the land. Two varieties of wheat are grown—the red surkh, and the white safed, known as "darid kharu." The white variety is grown in very small quantities. It yields less than the red variety—about five seers less per maund; but it fetches a higher price in the market. A rupee will purchase from one to four seers less of white than of red wheat. Wheat in the Delhi district is seldom grown by itself. It is generally sown in conjunction with gram (channa) or barley (jau). The produce of a mixed crop of wheat and gram is known as "gochani," and of wheat and barley as "gojari." Wheat is imported into Delhi from the surrounding districts for export to Calcutta and Bombay by the East Indian Railway. Details of the imports and exports cannot be given for the years 1872-73 and 1873-74, as in the returns wheat is included with other grains. In the two following years wheat has been shown separately; but whether the figures are correct or not is very doubtful.

Gurgaon.—The average area under wheat cultivation during the last twenty years as deduced from Form D, prepared by the Settlement Officer, is 64,997 acres, or considerably below the smallest area for the last five years. But as wheat cultivation is known to have increased greatly during the last few years, it is not impossible that both these estimates may be approximately correct. There are no statistics at hand for supplying information regarding imports and exports. That given in columns 12 to 21 is an estimate founded upon inquiries made from the principal grain-dealers of the district. There are no imports except of white wheat (dand), in small quantities from Delhi, for distribution at marriage feasts and use on special occasions, or by wealthy men. There is only one village in the district where this wheat is produced, and the quantity is inappreciable. Red wheat (surkh gehun), the only kind grown extensively, is commonly exported by road to Kosi, Muttra and Agra, also mostly by carts to Alwar, Jaipur and Bikanir, and to

Delhi both by road and rail. Since the scarcity in Western India raised the price of food-grains, exportation of wheat to Bombay has begun; but the dealers more generally transact their business with brokers in Delhi, who again deal with merchants in the more distant markets. Wheat is usually sown in November and December, and reaped in the end of March and beginning of April. The quantity of seed sown per acre varies from 70 to 100 lbs. according to the nature of the soil—clayey soils, chiknot and karmat, are preferred for the cultivation, and dahri or chahi land in preference to unirrigated. The cultivation is largest in Palwal and Nuh tahsils, while little wheat is grown in Rewari on account of the sandy nature of the soil, and also on account of the brackish water, which serves very well for irrigating barley, but is prejudicial to wheat. Rotation of crops is not observed; but the same crop is often raised upon the same land for several years in succession. When wheat is grown on dofasli land, it generally follows bajra or jowar; but most of the wheat-producing lands bear only one crop in the year. The land is usually ploughed from three to six times before sowing, and also watered where well or canal irrigation is available. In the Palwal tahsil manuring is also largely practised. Barley, gram and mustard are often mixed with wheat in the same fields. Where the newly-appointed zaildars get into working order, it may be possible to exert an influence upon the cultivators through the more intelligent of them, and to bring about improvements in the methods of agriculture by getting the people to understand what benefits would accrue to themselves from their adoption.

Karnal.—In August the land for cultivation of wheat is ploughed twice, and again twice in September. The earth is then worked up as fine as is possible, by means of comb rakes and other agricultural implements. In October the land is watered, if there has been no rain, and the seed is sown and covered up with earth, by passing over the ground a flat piece of board. The field is watered about four or five times from the time the seed springs up to the time the crop is cut. Two kinds of soil are preferred for the cultivation of wheat in this district, *viz.*, rousli and dakar. About 37 seers of seed are sown in one acre of ground. The wheat is sown after the kharif crop has been gathered in. Wheat is cultivated in this district in the months of October and November. Wheat from this district is exported chiefly to Umballa and Delhi; and imported from Muzaffargarh and Saharanpur districts. The local names for the wheat grown in this district are "pila" and "lal gehun," or yellow and red wheat. The cost of transit of wheat to port of shipment cannot be stated, as the wheat which is exported from this district is disposed of to the traders of Umballa and Delhi districts.

Hissar.—The land preferred for the cultivation of this cereal is styled "dakar" and "rousli." The quantity of seed per acre usually sown is 25 seers. This crop is sown after bajra, moth and other kharif grains are cut, *i.e.*, from the 15th October to the end of November, the harvest being ripe and fit to be gathered in April. It is principally imported on carts or camels from the Patiala State *viâ*

Tohana and Burwala, from Karnal *viâ* Jhind, and from Gurgaon, Delhi and Rohtak by the main Delhi and Sirsa road. The chief exports are by land to the foreign States of Bikanir, Jodhpur, Jaipur, Jhind, and occasionally also to Delhi. There are two descriptions of wheat cultivated—(1) called "kuthia," eared wheat, and (2) "pamman," or white. The former is, however, much more extensively cultivated, and is better appreciated by the people, being considered more tasty and nutritious. A sample bag from the last harvest has been already forwarded to the Financial Commissioner, from which it will be seen that there is a slight admixture of jau (barley) with the wheat.. This is said to be owing to the mixed quality of the seed originally sown ; cultivators here, as a rule, not being careful in selecting seed grown and keeping it free from admixture.

Rohtak.—The information in regard to exports and imports is very unreliable. There are no means of estimating this at all, and the information recorded was obtained by verbal enquiry. The farmers prefer the rousli, a light soil with admixture of sand ; dakar, a clayey soil ; and matyar, a soil that scarcely cakes for wheat-sowing. Thirty-six seers of seed per acre is used. Wheat is not sown after any crop ; the land selected for wheat must be left fallow from the preceding harvest. The surkh or red wheat, and the safed or white, which is also called "daudkhani." All traffic is eastward towards Delhi. The smaller area shown as under wheat during the last year was owing to the smallness of the rainfall at sowing time, also that larger areas were put under sugarcane and cotton in canal lands, leaving smaller space for the wheat. The produce of canal lands is said to be very much inferior indeed to that produced on other lands, with which it cannot in any way bear comparison. The average produce (11 maunds per acre) is declared to be a fair calculation. The average consumption is a matter not so easily arrived at, as very many of the population of 536,959 of the district do not eat wheat at all. In the return the calculation is made on the supposition that the whole population were wheat-consumers. At least 15 per cent. do not eat wheat ; and if this is deducted, the following will be the result. Total local produce (*i.e.*, 99,428 acres × 11 maunds per acre = 1,093,708 × 142,123 imports of 1876-77 = 1,235,831 — 132,477 exports of 1876-77 = 1,103,354. Actual consumption, distributed over a population of 456,416 souls, shows 193lbs. as average per head. The fact that since 1872-73 to this year the import of wheat into the district has been steadily and gradually decreasing, whilst the export shows as steady an increase, speaks in support of the presumption that this district has not been behindhand in contributing to the demands of outsiders for a supply.

Sirsa.—Wheat is generally sown on hard powerful ground in tahsils Sirsa and Fazilka, while in tahsil Dabwala on light clayey earth. The lands of the first two tahsils receive irrigation from the river streams and their cuts, while tahsil Dabwala lands are irrigated from rain-water. The ground is ploughed three or four times, and raked every time it is ploughed, previous to the sowing process. In tahsil Sirsa 32 seers per acre, in tahsil Fazilka 30 seers, and in tahsil Dabwala 17 seers, or on an

average 26½ seers, are sown in each acre of land. In Sirsa and Fazilka tahsils wheat is sown without any admixture, while in tahsil Dabwala it is sown mixed with gram or barley, in the proportion of five seers to a maund of wheat. Wheat is generally sown after the bajra and other autumnal crops are reaped, in October and November of each year. It is reaped in April and May. The importation of wheat is chiefly from Patiala, Bahawalpur and the Ferozepur district. It is exported chiefly to Bikanir, Jodhpur, Kurrachee and Mooltan. The varieties of wheat are as follows. In tahsil Sirsa (1) nali wheat, (2) nala wheat. In tahsil Dabwala (3) jungle wheat. In tahsil Fazilka (4) dandi wheat; (5) ratti wheat. (1) Brown wheat grown on the lands of the stream Ghaggar and on the old bed of the Choya is the nali wheat; (2) wheat irrigated by the new Sikandarpur cut is the nala wheat, its appearance is also brown; (3) wheat grown on the barani land of tahsil Dabwala is the jungle wheat; it is irrigated from rain-water; it is somewhat dark-brown in appearance; (4) white wheat grows on the banks of the Sutlej and its cuts, and it is called dandi wheat; (5) ratti wheat is the brown wheat, also grown on lands irrigated by the Sutlej and its cuts.

Umballa.—The soil known as "rousli" preferred for wheat cultivation in this district. Land generally manured after soil has been well moistened with rain; ploughed up as a general rule four or five times, and sometimes even as many as eight or nine times by the most industrious cultivators. The staple wheat of the district is the red wheat; but in some parts the daudkhani or white wheat is cultivated. Generally 32 seers (64lbs.) of seed are sown per acre about the beginning of November, or after the maize crops are well off the land. The principal portion of the imported wheat comes from the tract of country known as the "jungle," beyond the outlying portions of Ludhiana district, Battinda, and confines of Ferozepur; brought in carts *viâ* Ludhiana or Ferozepur, exported to Bengal and eastern parts, principally by railway. The statistics regarding imports and exports are not very reliable, as there is no satisfactory system of registration in force. No trade statistics being maintained, the municipal committees keep up a kind of return of imports and exports; but these statistics are not so reliable as the old trade returns.

Ludhiana.—Cultivation is preferred in neai and rousli chahi and barani lands; lb41s. of seed are sown per acre. The neai chahi land yields two crops—Indian-corn in the autumn, followed by wheat in spring. In rousli chahi and barani only wheat is sown in October and November. Chahi land must be manured, and is also watered two or three times in the month; whereas rousli land is dependent on the monsoons, and the oftener the land is ploughed up, the better the crop it will yield. The imports are from Ferozepur, and the Native States of Patiala, Nabha, Maler Kotla and Faridkot; and the exports to Patna, Saharanpur and Meerut—all by rail. There are four descriptions of wheat in this district: red-coloured wheat "dessi lal gehun," another a small stunted kind called "mundi," and a white wheat known as "dudhi," and a very large-grained kind of wheat called "burr bunnuk."

Simla.—The land preferred for cultivation of wheat is called "kool" land, or land with irrigation channels, and bakal land or the best barani land. The seed used per acre is about 20 seers. The wheat crop in this district is generally an average one. The season for cultivation of wheat is between the 15th September and 15th November. The trade route of importation into this district is Umballa and Ludhiana, Hoshiarpur and Suket. The local names of the wheat cultivated are safed kanak and lal kanak, or white and red wheat.

Jullundur.—By far the greater part of the wheat crop of Jullundur is grown on barani lands. The land is ploughed five or six times during the rains; a primitive way with a primitive plough, and the seed is sown regardless of weeds. Where wheat is cultivated on chahi or well lands, the ploughings are fewer, and some regard is paid to weeding before the sowings take place. Rich loam is preferred for cultivation, when sand does not predominate; but sowings are made and crops produced from every class of soil, according to its power and individual wants. Sowings begin from 1st October, and continue till the 15th November. About 58lbs. of seed are used to the acre. The crop follows cheri and môth; but the best wheat is produced from land which has lain fallow during the rains. Exports are chiefly to the seaboard at Calcutta. Imports are from the Malwa in greater, and Manjha in lesser, degree. Only one class of wheat is produced in quantity. This is called "kathi," or hard. Two other kinds are produced, but in a very minor, almost unnoticeable, degree. Their names are "daudkhani" and "budanak." Their grains are softer, better nourished, and purer in every way than those of the kathi kind. The kathi grain has generally a considerable admixture of barley and inferior grains in it.

Hoshiarpur.—Land ploughed from six to fifteen times. In Hoshiarpur pargana, maira, a poor sandy soil, requires six ploughings, while rohi, a richer soil, takes ten ploughings. Land preferred—rohi, maira, in Hoshiarpur pargana; but it grows freely on every soil. It is mostly cultivated on barani land, and seldom on irrigated land. Seed per acre—maira takes 18 to 22 seers per acre, rohi 27 seers, and land well manured near the village site will take as much as 35 seers per acre. Crops which wheat follows—chari (*sorghum vulgare*) and china (*panicum miliaceum*). Season of cultivation October or November; sown April; May harvested. Imported from Ferozepur, Ludhiana, Lahore, Gurdaspur. Exports in considerable quantities to Kangra and the hills; also to various markets in the plains. Of recent years it has been sent from Hoshiarpur to Calcutta and Kurrachee. This trade is about seven years old. Varieties—(1) daudkhani, hard semi-transparent look, said to yield a large proportion of suji; a first-rate grain, a variety of this has a very pure white colour, and yields a large proportion of maida; (2) lal kanak, a reddish grain, largely sold here; (3) budanak, a very large grained wheat, grown in the hills; (4) kanki, a hill variety of small grain; (5) mundri, a hill variety of small grain, a beardless wheat; (6) berera, wheat and grain mixed.

Kangra.—Wheat is sown in this district from 15th October to 15th November on both irrigated and unirrigated ground. It is

reaped in April and May, and forms part of the rabi crops. It is sown indifferently after any other crop except sugarcane, which exhausts the soil in one harvest a year. About 40lbs. of seed are sown to the acre. The outturn being hardly sufficient for the annual requirements of the people, there are no exports, except from one village on the border to another just across it. Rice is the staple of the agriculture, and not wheat. The people subsist mostly on other grains,—rice, Indian-corn, &c. This district therefore bears very little upon the object for which these statistics are required. The kinds of wheat grown are as follows: (1) kanku, white wheat, small grain; (2) mandrihan, white wheat, large grain; (3) rangri, red wheat, small grain.

Amritsar.—Wheat is one of the main staples of the district. After ploughing and cross-ploughing, the clods are broken by the clod-crusher. After this the ground is again ploughed, and the seed is hand-sown. A field is often ploughed over many times and manured; but all this depends much on the industry and means of the cultivator. The number of waterings a crop receives may vary from four to eight, and of course depends much on the dryness or wetness of the season. The grain is usually ready for the sickle by April. The lands preferred for this crop are those known as dosahi and maira, the former being a loose rich soil, in which all agricultural processes, such as ploughing, levelling, &c., are easily carried on, and from its lightness it is not so readily encumbered with weeds; the latter is a shallow light sandy soil, more or less dependent on rain. These, when properly ploughed and manured and sufficiently watered, yield a luxuriant outturn. The quantity of seed required for one acre is about 38 seers. Wheat usually follows cotton, chari or mash. As a rule, however, the plot intended for wheat is not sown for two seasons, during which it is well manured and frequently ploughed. The proper season for the sowing is about the middle of October: if sown later, there is less chance of its reaching maturity. There does not appear to be any trade in wheat between Amritsar and the sea-board direct, unless where a famine exists, as at present. This year there is an export trade with Bombay, but it is not considerable. During the Bengal famine there was a very considerable trade with that presidency in food-grains. Wheat is only imported from adjoining districts, and then only when the market is favourable. There is really no import and export trade in wheat to speak of. The varieties of wheat cultivated in this district are (1) vadhanak, a very fine grain, long, white and clear; (2) white (safed), is almost round like pearl barley, it has several varieties and is most esteemed; (3) gaddor, a mixture of white and red, sown together in one field under the name "bhera"; (4) ghoni, a small opaque grain, rather whitish, and is easily distinguished from the rest by the absence of skin or husk; (5) red (lal), a cheap corn, and though it has not so pleasing an appearance as the white, it does not appear to be in any way inferior to it in nutritious qualities, and on this account it is supplied for the use of the prisoners in jails.

Gurdaspur.—Wheat is grown on all kinds of land; but mehra land (mixture of clay and fine sand) is considered the best for wheat

cultivation. Generally no second crop is grown on such land. After the crop is cut, the land is allowed to remain fallow till the next sowing. It is ploughed after every heavy shower of rain for four or five times, or as many times as the cultivator can find time to plough it. The seed is sown (broadcast) in the beginning of October, and the crop is cut after the Bysakhi fair (11th April). About 20 seers of seed are required for an acre of land. The land is not manured; but land adjoining to the villages (goreh deh) on which more than one crop is grown is manured. There are only two kinds of wheat, *viz.*, lal kanak (red wheat) and chitta kanak (white wheat). The latter is only grown in the Pathankot tahsil, and is considered superior to the former. It is eaten only by the wealthier classes of people. There is not much trade in wheat in this district, the produce being considered equal to the demand. As a rule, the agricultural population do not generally eat the wheat they grow. Wheat is generally sown mixed, though slightly, with barley and gram.

Sialkot.—The land preferred for wheat cultivation is known as "dosahi," good loam, with a slight admixture of sand. The system of cultivation is as follows. The land is ploughed up from four times in some instances to twenty times in others, according to the means of the cultivator and quality of the soil. A harrow is next passed over to break up clods and level the surface. The land is then watered, and, when almost dry, ploughed up, and the seed sown broadcast; and the plough again passed through it, being finally levelled with the harrow—after which the field is divided off into permanent beds. Barani land is similarly treated, but is of course dependent on rain. Sixty pounds of grain are ordinarily sown per acre of land. The crop which generally follows wheat is wheat where the cultivator has sufficient land to admit of his allowing it to remain fallow in the interim otherwise; chari, maki and cotton follow wheat. Wheat is a spring crop, and it is sown in October, maturing in April. Two varieties of wheat are ordinarily grown in this district, *viz.*, the vandanak (or large white wheat) and the lal, or red wheat. The former is superior; it is large in size and white. Both are described in Powell's *Punjab Products*. The principal export trade route is Jammu and the neighbouring hill tracts; and wheat is imported from Jhelum and Rawalpindi.

Lahore.—Wheat is cultivated on the following kinds of soil: rohi, or rich loam; goera, or manured land; dosahi, or mixed clay and soft earth; myrah, or high land and light sandy soil. These lands are either irrigated by wells (chahi), or by canal water (nahri), or dependent on rain (barani). The best crops are raised on irrigated lands. Wheat is usually sown on fallow lands, though it sometimes follows crops of maize, china and kangni when the soil is manured. The quantity of seed sown per acre is 85lbs. Sowing commences about the middle of October and continues to the end of December. The crop is reaped in April. In barani lands mixed crops are generally sown, such as wheat and gram or wheat and barley; so that if the wheat crop fails, owing to scanty rains, something may be obtained from the other cereals, which do not require so much water. The local names are "wadanak"

(from wada kanak), or giant grain; ghoni, or white wheat; lal, or red wheat.

Gujranwala.—Dosahi is considered the best land for cultivation of wheat. Of the quality called "dagur" or "wadanak," large and heavy in weight, 50 seers per acre are sown. Niki and lal, a small and light grain, are sown 40 seers per acre. Lal (red) is considered next to dagur. Jowar and cotton follow wheat; but generally land is allowed to remain fallow. Wheat is sown in the month of October, and the harvest is gathered in April. Exports are made to Lahore and Mooltan. Imports from Jhelum, Guzerat, Shahpur and Sialkot.

Ferozepur.—Grown alike in all soils. From 20 seers to 1 maund of seed is sown per acre. In rohi (uplands) only wheat is sown. In bhet (low lands) and irrigated lands wheat follows maki (Indian-corn) and oorud (a kind of pulse). The cold weather is the season of cultivation. Imported from Battinda and Faridkot; exported to Calcutta, Bombay and Kurrachee. Local names of the varieties cultivated are buggi (white) and ratti (red). The latter is the more common and grown universally; the former only in parts of the low lands bordering on the river Sutlej.

Rawalpindi.—Wheat requires careful cultivation, and the fields have to be manured and thoroughly ploughed up for it. It usually follows no other crop in the same field. Lands which have lain fallow are preferred. Commencing from January, the fields are ploughed several times. Sowing takes place in August and September, the last week (20th to 28th) of the latter month called the "dhaya" being considered to be the fittest time for this process. From 20 to 30 seers of seed are sown in each acre. The winter rains nourish the plant, and the crop ripens in about 6 months, and the harvest is gathered in April and May. Lohi, or red, is the variety of wheat most cultivated in this district; and of another description called dagur, or white, a small quantity only is raised. Besides colour, which distinguishes these two varieties, there is a difference in the size of grains, the red wheat grains being smaller than those of white. The breadstuff made of white wheat, which sells dearly and is preferred for its colour, is supposed by the natives to be inferior in nutritious properties. The quantity of wheat produced in this district does not suffice for local requirements, and thus there is none to spare for export. On the contrary, a good quantity is imported from the neighbouring districts of Jhelum, Hazara, Peshawar and Kohat. Some wheat is imported from the ilakas of the Maharaja of Kashmir. The exports entered in this statement are to the adjoining districts.

Jhelum.—The land for wheat cultivation is ploughed over and over several times as the weather permits till the soil is made soft. The land preferred for wheat cultivation is irrigated and bela lands, but a great portion is sown in lands dependent on rain, *i.e.*, barani. Generally the quantity of seed sown in the district is at an average of 28 seers per acre. It is not every soil that produces two crops; the superior soil can only effect this, and that which is sown previous to the cultivation of wheat is maki, jowar, bajra and mote, &c. The season for cultivation of wheat is from the 15th October to 15th November of each year.

There is no particular route of trade for import and export of wheat. It comes in and goes out from all directions; but the more frequented routes for exports are by railway and boats. The local names of this district for wheat cultivation are dagur, rodi, lal and safed, descriptions of which it is somewhat difficult to supply, as the grains are almost about the same.

Guzerat.—Wheat is sown in three descriptions of soil. The first and most preferred is the gora chahi, or land in the vicinity of towns and villages, which is fully manured and well irrigated. The second is the dosahi, or soil free from admixture of sand. This is sub-divided into the dosahi chahi and dosahi sailaba, according as the irrigation is from well or flood, and is more remote from town or village than land of the first description mentioned. The third is the mira, or sandy. This is sub-divided into the mira rohi, slightly sandy, the mira barani and mira sailaba: in the latter two kinds of mira the irrigation is from rain and flood respectively. The gora chahi or first-class land produces the wheat called "dagur," which is a white and heavy grain of first quality. The second description of soil, the dosahi, which is inferior to the first in matter of culture only, produces dagur of second quality and the nikki, or small red wheat. The mira or third-class land produces the nikki of second quality and the jowagal or nikki mixed with barley. The amount of seed sown in the above three classes of soil is from 25 to 30 seers per acre. The sowing of wheat in the gora chahi and dosahi lands is preceded by the spiked and great millets (bajra and jowar), and by the maize (maki). The mira lands yield one harvest only. Wheat is usually sown in regular rotation on this land. Occasionally the land is left fallow, or an autumn crop raised instead of the spring wheat. Wheat is sown in October and November. The exports of wheat from this district are very inconsiderable, nor are the imports extensive. The import is from Jammu territory, chiefly by the Bhimbar route, on mules, ponies and camels. The export is by rail to Lahore, Amritsar and Mooltan. The local names have been given above. There are not well-known corresponding English names, but the grain would be known as described in this memorandum: thus dagur, white and heavy; nikki, small red wheat; jowagal, mixed.

Shahpur.—An acre of land produces 9 maunds and 35 seers of wheat per acre. The following descriptions of land are preferred for wheat cultivation: (1) chahi, or land irrigated by wells; (2) sailaba, subject to inundation of river; (3) nalewali, irrigated by canals; (4) kahar, in which rain-water stands for some time; (5) hail, or land irrigated by hill torrents and manured; it is generally adjacent to villages; (6) laga, low land in thal or desert, dependent for inundation on hill torrents. Such lands are said to produce 1 maund or 80lbs. of wheat per acre. The first four descriptions of land are allowed to lie fallow for a whole year after the following crops have been grown on it, *viz.*, the kharif crops of bajra, jowar and cotton. The two last, *viz.*, hail and laga lands, yield both kharif and rabi harvests. Wheat is usually sown in this district any time between 15th October to the end of November, but in the sun or hill portions of the district between 24th September and 24th October; otherwise the excessive cold prevents the seed

germinating. The wheat consumption would be much larger, did not the agricultural and poorer classes vary their diet during certain months of the year, by living on jowar and bajra; and in the thal (desert) they live chiefly on hinduwana, or wild water-melon, which springs up in those localities spontaneously in the winter, and affords food for man and beast. Wheat is imported from (1) Kachi, in the Dera Ismail Khan and Bannu districts; (2) Dhani Ghaib and Pathwar, in the Jhelum and Rawalpindi districts; (3) from Guzerat: wheat is seldom exported from this district, save when famine raises the price at Mooltan and Kurrachee, where it is conveyed in boats down the Jhelum river. The sun wheat, which is famous for its purity and whiteness, is much valued for exportation to England. The following descriptions of wheat are produced in this district: sun kanak; this wheat, already referred to as grown in the sun, is red in appearance and sweet in flavour; dagur, white in appearance, is a long-shaped grain; rodi or dandkhari, is a red roundish grain, short, full ear; ratti, is grown with barley, and is not in consequence pure,—very little is grown in this district.

Mooltan.—The land preferred is sailaba; next comes canal or well irrigated land; and lastly, barani (canal irrigated) land is soaked with water before the inundation flow has ceased. It is then ploughed two or three times in September. The seed is sown in November-December, and the crop is fit for reaping about 15th April. Very good land is irrigated two or three times during the cold season; sandy soil, half a dozen times or oftener. The use of manure is not general, save in the neighbourhood of towns. The seed allowed is 1 to 1¼ maunds. Grain is received by rail from Lahore, Montgomery and Ferozepur, and from Shahpur, Jhang and Gujranwala by boat. It is not an uncommon thing for it to be stored for a couple of years in Mooltan. The sorts are as follows:—makai, white in colour, grains smallish, round and plump; rodi, white large grain, apparently rare (I have not been able to procure a sample); pambar, yellow in colour, grains large and elongated, with a shrivelled appearance; ratti, common red wheat, grains of the same shape as makai, very hard.

Jhang.—Land preferred is ratti; one maund and ten seers of seed per acre. Maki and jowar crops follow wheat, which are generally sown some time in July (wheat is sown in October-November). Road to Mooltan and river Chenab are the trade routes for exportation of wheat. The import route is now almost entirely by Chechawatni road from Montgomery district. The local names for the varieties of wheat cultivated are pamman, a fine long grain; ratti, dirtyish and reddish grain; rodi, a fine white grain; joali, wheat mixed with barley; konch or makni, a short grain of wheat.

Montgomery.—The qualities of land known as gasra or loamy, sikand or clay soil, reth or sandy soil, and karkam or an inferior sikand (a fair soil when well irrigated), are preferred for the cultivation of wheat. Of these, gasra is the favourite soil, which fortunately is the prevailing one in this district. One maund (of 80lbs.) and eight seers of wheat per acre is sown in the month of Kartick. In Magar, owing to the lateness of the sowing season, it is necessary to scatter a maund-

and-a-half of seed per acre. The land in which wheat is sown is usually allowed to lie fallow for one harvest, so as to enable it to recover its original capacities; but in a very few cases cultivators who possess a small piece of land do not allow their land to lie fallow. In these cases manure is generally employed to improve the fertility of the soil and supplement irrigation. The crops which wheat follows are cotton and jowar (used as fodder for bullocks, &c.). The season for cultivation is from the month of Kartick to Bysakh. The cultivators sow the seed after ploughing the ground twice or thrice. It is believed that with deeper ploughing, in the European fashion, there would be a better outturn. The following are the local names and varieties of wheat cultivated in this district:—khoni; this wheat is white, round and of superior quality, it is free from any admixture of barley or other gram: pauri; this is not cultivated to a very great extent in this district, the grains are white, like those of khoni, but a little longer: pamman; this is of a darker colour, the grains are long: ratti, or red wheat, its grain is longer than khoni and smaller than pamman. The average area for five years under wheat cultivation was 200,043 acres. The average annual outturn was 3,045,657 maunds. Of this, four-fifths were consumed in the district; the remaining fifth was exported. A regular export of wheat from this district has begun, and seems to be only limited by the capacity of the steamers to convey it from Mooltan to the sea. It will be seen from the statement that the consignment of wheat to Mooltan has nearly doubled during the last year; 3,000 maunds appear as having been sent for the first time from this district to Calcutta; 50,000 maunds have been sent to Bombay, and 15,000 are reported to have been sent to Kurrachee. This latter item is, however, not correct, as the wheat sent to Mooltan was for the most part unquestionably destined for foreign export by Kurrachee.

Muzaffargarh.—The description of land best suited for the cultivation of wheat is that of the best sort or first quality known as "milk," and is the sort which is preferred to other inferior soil, which is known as "ghas," &c. Land uncultivated during the season immediately preceding the sowing of wheat is better suited, owing to its possessing greater producing power, and many cultivators allow portions of their estate on which they propose sowing wheat to remain uncultivated for a short interval prior to the time for doing so. The quantity of seed required for sowing in an acre varies from one to one-and-a-half maunds, according to the quality of the soil, being required to be put down in superior, and a larger quantity in inferior, soil. The sowing is effected from about the middle of October to end of November after the gathering in of the kharif harvest, and follows such crops as jowar, bajra, cotton and indigo. It is advantageous to use the land from which indigo has been just gathered, as any remains of that plant left on it enrich the soil. Generally from about the beginning of August to the middle of October the land is under preparation, the number of ploughings being from three to four; and from the sowing of the seed to its progress to full growth the field is watered three or four times when the soil is superior, and six or seven times if inferior. In the case of land bordering on the river little or no water is required, owing to the natural moisture;

but cultivation carried on in the "thal" has to be watered six or seven times. The crop is cut and gathered during the months of April and May. The different varieties of wheat cultivated are as follows :—(1) umr budh (white wheat) ; this kind of wheat is much cultivated, and is generally used for food, and is free from barley : (2) pamman (kalandarwala) ; this sort is less cultivated, the grain is long and narrow like that of rice, it is used for food, roasted : (3) gaji (kalandanauda) ; this sort is cultivated in sailaba lands, it is mixed with barley : (4) maki mandiwala (grown in Alipur) ; this is little cultivated, its grain is round like that of jowar, and used as chabena grain : (5) kanjbori ; this is cultivated on river banks, and is of a red colour : (6) white wheat ; the same remarks as No. (1) apply : (7) white wheat, second class ; this is much cultivated here : (8) rodi ; very common in this district, round grain, much used for food : (9) wadang (*alias* pamar), red coloured, little cultivated, and a long thin grain. Nos. (1), (5), (6), (7) and (8) are the kinds most largely produced and consumed ; (1) and (6) are of the finest quality and sold at a higher price, while (5), (7) and (8) are the classes of wheat chiefly consumed by the poor ; the other three kinds are neither largely cultivated nor much used. The quantity of seed per acre may at an approximation be fixed at about 100lbs., which, compared with the average outturn, is fairly satisfactory. There has been a steady increase in exports during the past three years, and the rabi harvest of the present year, just reaped, promises to show very satisfactory results also.

Dera Ismail Khan.—Wheat is grown all over the district. It is the principal crop grown on thal wells, and is grown on all the best of the Indus alluvion lands, where it is also the main crop. In the tract between the Indus and the hills wheat is the favourite crop, though not so extensively grown as bajra and jowar. The lands preferred for the cultivation of wheat are those that have received the best silt from either Indus inundation or torrent irrigation. In fact, wheat is sown in all lands which have been thoroughly irrigated in time for the wheat, sowings in which take place in the months of October and November in this district. The average amount of seed used per acre is one maund of 80lbs. There is less sown on light soils, and more on manured land. The average consumption of the district is not more than is entered in this return. The average area under cultivation may sometimes be under what I have put it at. The quantity available for export, after deducting quantity required for seed, may be safely estimated at 1,000,000 maunds per annum. The chief part of this is exported down the river Indus to Sukkur and Kurrachee ; part goes to Mooltan, where it meets the railway. A great quantity of Marwat wheat from the Bannu district passes through the district to Dera, where it is put on boats and sent down the river. The varieties locally known are white and red wheat. The former is a little more expensive than the latter, and is grown on fluvial lands ; while the red is grown on the daman, or tract lying between the river and the hills.

Dera Ghazi Khan.—Wheat is grown on the best lands known as milk and ghas. It is sown pure and mixed. Pure wheat is known as khari, and wheat mixed with barley as jowala or goji. The best wheat

is grown in the danda, or high dorsal tract of the district. Wheat is mostly grown on well lands, and in the "pachad" only when the rains are too late to allow a kharif crop, or where the lands have exceptionally favourable irrigation. Twenty seers of wheat are required per acre for seed. Wheat is sown in October-November, and reaped in April and May. Wheat usually follows cotton in the rotation of crops. The principal export here is down the river Indus to Sukkur. I have already given the local names for wheat. The best wheat is called "sakkar" or "chitti," and is pure wheat. White wheat is considered the best.

Bannu.—Marwat, one of the parganas of this district, is celebrated for its wheat and gram. The soil is generally a very light one, what looks like sand of about six inches in depth below which is a thick clay. Other land used for wheat is irrigated from the Kurram, or is the alluvial bed of the Indus. Seed sown per acre is 76 maunds. In Marwat wheat and gram are alternately sown. In irrigated lands wheat follows Indian-corn (makki) or bajra. Wheat is sown in October and November. Wheat is imported from Khuttuck for the Bannu market, and also for export from Isa Khel to Sukkur and for export to Dera Ismail Khan. Export is principally from Isa Khel to Sukkur, and from Marwat to Dera Ismail Khan for local consumption, and also export to Sukkur. From Mianwali pargana some quantity is sent to the Shahpur and Jhang districts, and from Marwat and from Bannu parganas into the neighbouring hills. The wheat is of the red description. There are no special names for it. There is a large surplus production which could be exported, but the means for doing so is limited. Boat hire has been lately as high as Re. 1 per maund from Isa Khel to Sukkur. Trade is interfered with to some extent by the seizure of boats for Government purposes at odd times and seasons. If there were a light line of railway from Bhakkar opposite Dera Ismail Khan to Shershah Ghat, there could be ample work for it, what with the grain trade and that of the Powindas. The country is perfectly flat, and no streams to cross; so that little more would be required than placing the sleepers and rails on the ground. The material of the metre-gauge line from Lahore to Jhelum will soon be available. It could scarcely be put to better use than on this line. The amounts entered as average under wheat imports and exports are to a great extent guess-work. The average under wheat is only exactly known for the one year in which the survey was made. As for the imports and exports, there are no means for finding out with any exactitude what they are. The surplus production is brought into use in the bad years, which occur in four or five years in Marwat. If exports increased, a great impetus would be given to the increase of cultivation.

Peshawar.—On the conclusion of the rainy season, unirrigated land is ploughed three times, and then sown. Irrigated land is watered three times till the crop is ripe. Seed is generally sown broadcast except on unirrigated land: when the soil is not sufficiently moist, it is sown by means of a wooden tube attached to the plough. The land preferred is known in this district as "robi," which is the best soil for the cultivation of wheat. Robi has a little mixture of sandy soil. On unirrigated

land 20 seers of seed are sown per acre; on irrigated land 16 seers. Cotton, moth (*phaseolus aconitifolius*), chari (*holcus sorghum*), and maki (Indian-corn) follow the wheat crop. From 15th October to 31st December the land is ploughed and seed sown. The crop is reaped from 25th April to 30th June. Wheat is imported *viâ* the Kohat pass from Chauntra in the Kohat district; exported to Ṭatara and Abkhand (independent territories). The following varieties of wheat are cultivated in this district:—pirka ulsi, reddish-brown, round grain; mori, white wheat, long and large grain; and munde, light-brown, small grain.

Hazara.—Land preferred is lapara and bari near villages. Seed sown per acre is 24 seers. Crop which wheat follows—maki, bajra, jowar and rice. Season of cultivation autumn. Imported from Rawalpindi and Hoti Mardan and Peshawar. Varieties of wheat cultivated—white (dagar) and red (ratti).

Kohat.—The land intended for wheat is ploughed from five to ten times by means of a rude plough composed of a small pointed wooden share, tipped with iron. The pole is fastened so close to the rest of the share, that the ground is penetrated to the depth of seven or eight inches only, and is very slightly turned up. The plough is usually drawn by a pair of oxen, and the amount of ground (qulha) which a pair of oxen can work was, before British rule, the universal unit of husbandry. A qulha of land amounts to about three acres. Some ten loads of manure are applied to a simple acre of land. The manure is ploughed in, the furrows at each ploughing running at right angles to the previous ones. It is either thrown on the land before the seed is sown, or on young wheat when it is some six inches. In the latter case it is of course not ploughed in. In soft and sandy soil the drill-plough is occasionally used; but the seed in this district is, as a rule, sown broadcast. Strictly straight ploughing is rare; and in some parts of the Khattak country a system of ploughing in a succession of concentric circles obtains. A wooden platform, locally known as "mala," is occasionally drawn by bullocks, over the ploughed field to work in the seed; but the usual instrument is a rude wooden harrow, locally known as "ghakkara." The various soils are locally divided into four kinds, distinguished by the following Pushtu names. First, rekmina (literally silky) alluvial; second, matina, loam; third, shagina, sandy; and fourth, sanger (or kanriza), stony. The rekmina and shagina lands are preferred for the cultivation of white wheat. The best red wheat is sown in the sandy tract of the Chauntra valley and other parts of the Teri Khattak sub-division, where this description of soil very greatly predominates. In the Baizai and Samilzai sub-divisions the soil is for the most part matina (loam); but there is a goodly portion of rekmina (alluvial) land. In the Miranzai valley the soil is for the most part matina (loam); but the zamindars manure freely, and therefore very superior crops are produced. Sanger or (stony land) is to be found in many parts of all the sub-divisions of the district. Some 25 seers of grain are sown per acre. Wheat follows the autumn crops of jowar (*holcus sorghum*) and bajra (*holcus specatus*). In irrigated and richly-manured lands the land is not allowed to lie fallow at all; whilst in rain-lands,

which are seldom, if ever, manured, it lies fallow for one or two harvests. Wheat is sown during the months of Assin, Kartick, Magh and Pous (September to December) inclusive, but the principal sowings are in Assin and Kartick (September and October). It is irrigated some seven or eight times, and the harvest ripens in May. The grain is not threshed but trodden out by oxen, and cleared by being threshed in the air with a wooden shovel. The trade route for the small import of wheat from Bannu is along the military high road between Bannu and Kohat, and from Kurram, a district under the Kabul Government, along the military road from Kohat to Thal, the extreme British frontier village on the banks of the river Kurram, the western base boundary of British territory in this district. The local generic Pushtu names for the two kinds (white and red) of wheat are as follows:—moari, or white, surki, or red. The white wheat of Baizai and Samilzai are also known to traders as kalangi. That of Samilzai is more prized than that of Baizai, and from it better bread is made. The superior red wheat of Baiza i is also known as als surkai (or real red) and ratti. The inferior red wheat of Miranzai is also known as miyandz surkai (middling red) and sindi. The white wheat of Miranzai is known also as spinghanni (white wheat), and is the most prized for bread; of all the white wheat produced in the district that of Samilzai being second best. The red wheat of the Chauntra valley (Teri Khattak), also known as sraghannia (red wheat), is considered the best for its bread-making qualities of all the wheats (red and white) produced in the district. Though its flour is not as white as that of the Baizai, Miranzai and Samilzai white wheats, the bread made from it is whiter, better and more easily digested.

No. 1145, dated Shillong, the 24th April 1877.

From—S. O. B. RIDSDALE, Esq., Secretary to the Chief Commissioner of Assam,

To—The Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce.

I am directed to acknowledge the receipt of your Resolution No. 1-48, dated 14th March 1877, forwarding copies of certain papers on the subject of the qualities of Indian wheat which are most appreciated in the English market, and requesting the adoption of necessary measures for the improved cultivation of this grain, and for facilitating its transport to England in good condition.

2. In reply, I am to say that wheat is not grown for export in this Province.

No. 131-1, dated Camp Mercare, the 13th May 1878.

From—MAJOR T. G. CLARKE, Secretary to the Chief Commissioner, Coorg,

To—The Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce.

In reply to the Government of India Resolution No. 1-47, dated 14th March 1877, calling for a report on the cultivation of wheat, I am

desired by the Chief Commissioner to state that wheat is not grown in Coorg, and that the consumption of the grain is confined chiefly to the Europeans resident in the district. Wheat is imported from Mysore and from the Konkan (the country below the Western Ghâts), and the quantity brought in exhibits a small, but gradual, increase during the five years from 1872 to 1876.

The figures are as follows:—

	lbs.
1872	69,600
1873	71,360
1874	86,400
1875	94,400
1876	99,200

No. 83, dated India Office, London, the 3rd July 1879.

From—The Secretary of State for India,
To—The Government of India.

With reference to your letters noted in the margin, I forward herewith a copy of a report by Dr. Forbes Watson on the results of examination of the samples of wheat forwarded to this country from time to time by order of your Government; and 500 copies of the same paper will also be transmitted to your address through the Store Department of this office.

Agriculture and Horticulture—

No.	17,	dated 30th March	1877.
„	32	„ 6th August	„
„	35	„ 27th „	„
„	37	„ 27th September	„
„	39	„ 8th November	„
„	40	„ 7th December	„
„	2	„ 18th January	1878.
„	8	„ 22nd March	„
„	13	„ 15th July	„
„	17	„ 29th „	„
„	23	„ 31st October	„

2. I request that, as suggested by Dr. Watson, about 360 maunds of each of the four varieties mentioned by him may be forwarded to this office with the least possible delay, with a view to their being ground into flour, and also that further samples of Punjab wheat may be sent, the former ones having been for the most part damaged by weevil.

3. I desire at the same time to be furnished with the result of the inquiries ordered in the Resolution of your Government of the 14th March 1877 respecting the statistics of wheat cultivation in India.

4. The question of introducing to any extent steam-threshing machinery into India, referred to in my despatch No. 6 of 30th January last, should be considered in special connection with the present papers.

REPORT ON INDIAN WHEAT, BY DR. FORBES WATSON.

Introduction.

In submitting the subjoined report on the samples of Indian wheat forwarded to this office in accordance with the Resolution of the Government of India of the 14th March 1877, I would take the opportunity of pointing out a few of the principal results of the examination, together with their bearing upon the question of the supply

of Indian wheat for the European market. The Resolution referred to directs the collection of detailed statistics and other local information on the subject of the cultivation of wheat; but the results have not yet been received, and the report has accordingly been restricted to the examination of the question mainly by the light of the evidence afforded by the samples themselves. The subject derives at the present time an unusual importance from the obvious consideration that the depreciation of silver, which affects so injuriously the finances of India, can be best counteracted by a development of the Indian export trade. Until, however, the information now in course of collection has been received, the question of the production and export of wheat from India cannot be treated with the amount of statistical detail which it deserves, as the materials available in the usual administration reports are of a fragmentary and incomplete description. At the same time it will be found that the examination of the large collection of samples under report has of itself led to some conclusions which may have an important bearing on the future of the Indian wheat trade.

Bearing of the wheat export on the silver question.

2. The number of samples amounted to more than 1,000; and together they form by far the most complete collection of Indian wheat ever brought to this country. The valuations of the individual samples are given in the tabular statements at pages 26 *et seq.* (pages 270 *et seq.* of these Selections), whilst the section commencing at page 11 (page 247 of Selections) will be found to contain a number of special observations referring to them. For the present purpose, it will be sufficient to refer to the summary table at page 9 (page 245 of Selections), which presents a synopsis of all the chief results, and indicates the number of samples of each variety of wheat received from the different provinces of India, as well as their quality, range of price and average value. A map is also appended showing the geographical distribution of the chief varieties, and the report is accompanied by a collection of samples, illustrative of the more important kinds of wheat grown in India.

Report, map, synoptical table of results, and typical collection of specimens.

3. By arranging all the samples, according to price, in classes corresponding to the usual classification of soft white wheats, the following result is obtained:—

Principal results of the valuations.

	Number of samples.				
	Soft white.	Hard white.	Soft red.	Hard red.	Total.
Superior samples, 44*s.* to 48*s.* per quarter of 496 lbs. ...	101	...	...	...	101
Grade No. 1, 41*s.* 6*d.* to 43*s.* 6*d.* ,, ,, ...	123	13	10	...	146
Grade No. 2, 39*s.* 6*d.* to 41*s.* ,, ,, ...	73	83	56	...	212
Ordinary, 37*s.* to 39*s.* ,, ,, ...	51	61	74	68	254
Inferior, below 37*s.* ,, ,, ...	9	10	20	75	114
Total number of samples ...	357	167	160	143	827
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Average price per quarter ...	41 9	39 5	38 5	36 1	39

It will be seen that wheats equal or superior in value to grades Nos. 1 and 2 of white wheat form the greater portion of the collection, numbering in fact 459 samples against 368 ordinary and inferior samples. Moreover, out of a total of 827 samples, 101 must be described as being of a very superior quality, whilst only 114 samples are decidedly inferior.

Comparison of the prices realised by the Indian samples with the current quotations of foreign wheats.

4. The surprisingly favourable character of these results will be clearly perceived on comparing the prices assigned to the Indian samples with the quotations current at the time of valuation for the different kinds of wheat in the London market, *viz.* :—

Danzic	per quarter of 496 lbs.	42*s.* to 46*s.*
Australian	„	47*s.* „ 48*s.*
Californian and Oregon	„	44*s.* „ 45*s.*
White American and Canadian	„	42*s.* „ 46*s.*
No. 1 Milwaukee	„	42*s.* „ 43*s.*
No. 2 Milwaukee	„	40*s.* „ 41*s.*
No. 2 Spring	„	38*s.* „ 40*s.*
No. 3 Spring	„	36*s.* „ 37*s.*

No higher quotations than those realised by numbers of Inditan samples appear in this list, the highest being the quotation for Australian wheat at 47*s.* to 48*s.* per quarter—a price which has been realised by a certain number of the best Indian samples. It will be likewise seen that the most numerous classes in the Indian collection are those which correspond in value with the better kinds of American wheat quoted in the list.

Comparison with current quotations of English wheat.

5. The valuations of the Indian wheats compare even more favourably with the prices of English wheat. At the time of valuation the quotations for new English white were from 30*s.* to 45*s.* per quarter (of 480 lbs.), and for new English red from 30*s.* to 41*s.* per quarter; while the average weekly rate throughout the United Kingdom was only 38*s.* per quarter. It will be seen that the Indian collection contains numbers of samples exceeding in value the highest of these quotations, while the average for the whole collection amounts to 39*s.* 8*d.* per quarter, or to nearly 2*s.* above the average of the United Kingdom. It must, however, be explained that the last English crop was one of exceptionally poor quality, as shown by the fact that at the date of the valuations (beginning of February 1879) the bulk of the English wheats were almost unsaleable at Mark Lane in consequence of their poor condition.

India admirably suited for the growth of the finest qualities of both soft and hard wheat.

6. The above facts conclusively show that India is well adapted for the growth of wheat of the finest quality. It must be, however, kept in mind that a considerable number of the samples sent from India were far superior to any Indian wheat usually seen in

the London market, and that without more local information than we now possess it is not possible to decide whether these fine varieties could at present be forthcoming in quantities sufficient for the development of an important trade. In fact, Messrs. Finlay, Scott & Co. state, in a letter printed among the enclosures to the despatch from the Government of India on the subject, that on the Bombay side the supply of the best qualities is very limited as compared with the common qualities, and that the prices of the fine wheats are so well kept up in India itself, that more profit is to be obtained on the shipment of inferior than of fine wheat. Be this however as it may, one result is clearly apparent from the mere inspection of the samples; and that is that the cultivation of the finest wheat cannot be considered as anything exceptional, but that it is spread over a considerable portion of the country. If samples like those mentioned in the valuations as being equal to the finest Australian or Californian had only been sent from a few places, their occurrence might have been explained as due to unusually favourable conditions which do not apply to the country at large. But samples of equal or only slightly inferior value were sent from district after district. It is not from one nor half-a-dozen places that the best samples were received, but probably from more than 100 different localities. More than 60 districts sent one or more samples of soft white wheat reported as superior to No. 1, and valued at from 44*s.* to 48*s.* These 60 districts include the greater portion of Behar, the North-Western Provinces, Oudh and the Central Provinces; and it is probable that, but for the weevilled condition in which most of their samples were received, the same might have been said of the Punjab and Sind. In addition, perhaps a dozen more districts in Bengal, Bombay and Berar may be counted which though not producing soft white of a similarly high character, yet grow a hard white wheat equal to the finest wheat of the same kind grown anywhere. The provinces above mentioned include the whole of the wheat-growing area proper in India. Madras, Mysore and Burma are evidently but little adapted for the cultivation of wheat, the few samples received from them being mostly very inferior in quality. We thus arrive at the important conclusion that, throughout the wheat-growing part of India, the cultivation of the finest varieties is well understood and extensively practised. This is a most important fact, bearing not only on the development of the wheat trade, but also on agricultural progress in India generally; for it indicates the existence of a much higher agricultural skill than India has usually been credited with. We often hear of the ignorance of the Indian ryots, and of their careless and shiftless modes of cultivation. But a glance at the collection of Indian wheats under report proves that there must exist all over India a numerous class of agriculturalists to whom such a reproach cannot apply. It is impossible to avoid the conclusion that the ryots who grew those samples of soft wheat equal to the finest Australian, or of hard wheat equal to the finest Kubanka, must be as keenly alive to the advantages of selection of seed and of careful cultivation as the most intelligent English farmer; and our samples prove that such ryots are to be found in almost every wheat-growing district.

Observations on the present low level of prices.

7. With regard to the prices assigned to the Indian samples, it is necessary to remark that although they compare very favourably with the quotations of the various English and foreign wheats in the market, yet they afford a much smaller margin as compared with the prices current in India than has been the case in former years. It must be observed, however, that the exceedingly low range of prices for wheat and other grains now ruling in European markets seems quite exceptional, whilst the prices in India are unusually high. As pointed out in the *Economist* of the 1st of March of the current year, the price of wheat in England has only twice within the last 100 years fallen to the present level, *viz.*, in 1835 and in 1851. Two causes have mainly contributed to bring about the present state of the market. The crops produced in America for two years in succession have been exceptionally heavy, while the existing financial depression and distrust combine to restrict the scale of commercial operations; so that, notwithstanding the cheapness of wheat, the stocks in England continue low, as the grain merchants cannot obtain from the banks the usual advances. In India, on the contrary, the prices ruling in the chief producing districts are higher than in normal years, partly on account of the exhaustion of stocks by the recent famines, partly on account of the apprehensions excited by the unfavourable season in the North-Western Provinces and in the Punjab. So far, these causes have undoubtedly resulted in a very considerable diminution in the arrivals of Indian wheat in this market.

Comparison of India with other wheat-producing countries.

8. But whatever may be the case, under such exceptional conditions as those now prevailing, all the facts point to the conclusion that, as regards wheat, India may shortly become one of the chief sources of supply for the United Kingdom. It must be borne in mind that India is one of the largest wheat-producing countries in the world. The production of the United Kingdom amounts to only about 10,000,000 to 13,000,000 quarters per annum. Austro-Hungary, Italy and Spain each produce about the same quantity. Germany produces from 15,000,000 to 18,000,000 quarters, and the two countries which produce the largest amounts are France and Russia, each producing from 30,000,000 to 35,000,000 quarters per annum. Both are surpassed by the United States, which produced during each of the past two years upwards of 45,000,000 quarters. No complete statistics exist for India, but we know that the Punjab alone produces about as much as the United Kingdom, Oudh about 3,500,000 quarters, the Central Provinces about 3,000,000, and Bombay not much less. The production in the North-Western Provinces proper has never been estimated, but must be fully equal to that of the Punjab, and that of Behar is also known to be considerable. Thus the yearly production of the provinces under direct British rule will amount to from 30,000,000 to 35,000,000 quarters, or to the same quantity as that produced by Russia or France. But if the Native States in the Punjab, Rajputana, Malwa, Bandelkhand and Guzerat be added, in all of which wheat is largely cultivated, it will be found that India must be considered as being, next to the United States, the largest wheat-producing country in the world.

9. The prospect appears even more encouraging when viewed in connexion with the results already mentioned of the examination of the samples under report. Whilst as regards cotton and some other produce the soil and climate of India are rather at a disadvantage with those of other competing countries, as regards wheat India is proved to be admirably adapted for the production of the finest qualities of both soft and hard wheat. This is a circumstance of great importance, because the supply of the fine varieties is much more restricted than that of the commoner kinds. In considering the competition in the market of the world, France, although producing as much as Russia, may be left out of account, as its production, large though it be, barely suffices for its own consumption. Thus, practically, Russia and the United States are the chief competing countries to be considered. But in both countries the area for the production of fine full-grown winter wheat is comparatively restricted. Spring wheat forms a very large proportion of the Russian supply, as the greater part of the country is too cold for the growth of winter wheat. In the United States likewise, the climate of Minnesota, Iowa and the other States on the Canadian border in which the cultivation of wheat has been recently so rapidly extending is only adapted for the growth of spring wheat. This wheat, which is mostly red, is not only inferior in quality to a good winter wheat, but it produces also a much lighter crop, not more than 12 to 15 bushels per acre. Thus, however much the cultivation may extend in these parts, it is not likely to affect the supply of the finest varieties, such as are grown in some of the older States or in California.

The true policy for India in the matter of wheat is to encourage the cultivation of the finest varieties.

The true policy for India, therefore, appears to consist in taking advantage of her climatic position, and cultivating for export only the finest varieties, in which the competition of Russia and the Far West in America is not likely to be as severe as in the case of the common varieties. Such a policy receives additional recommendation from the fact that the price of the finer varieties is always better kept up, and suffers less in a falling market than that of the common wheat. The higher priced wheat will likewise support better the necessarily high charges of transport and freight.

10. The bulk of the Indian wheat as actually shipped to this country is, however, by no means of a high quality, as the good average Indian wheat chiefly known in this market only classes with grade No. 2. There is room for considerable improvement both in the quality of the grain itself and as regards the condition in which it is sent to this market. The three principal causes which at present tend to depreciate Indian wheat are (*a*) the mixture of different varieties of wheat, white and red, hard and soft, in the same sample; (*b*) the admixture of other grain, such as barley, gram, rape or linseed; and (*c*) the presence of foreign matters, such as chaff, earth, lumps of clay, and dirt of every description.

Causes of the inferior quality of the bulk of Indian shipments of wheat.

(*a*) With regard to the mixture of different varieties of wheat, that of hard with soft wheat is the most objectionable, as also the most frequent. The mixture of soft red with soft white wheat depreciates

the price to a certain extent, though many samples of such mixed wheat were highly reported on; but the presence of a considerable proportion of hard grain reduces the value materially.

(*b*) The admixture of foreign grains reduces even more the value of the wheat. Many samples from the Punjab, Sind, and also occasionally from Bengal and the North-Western Provinces, are so mixed with barley as to be quite unfit for milling; and the presence of smaller quantities of gram or oilseeds is frequently met with in samples coming from every province.

(*c*) The third cause of depreciation—the presence of chaff, earth and other extraneous matters—is likewise more noticeable than would be the case if the wheat trade were properly organised.

11. Fortunately no serious difficulties seem to stand in the way of effecting a great and rapid change in the character of the wheat exported from India. The quality of the grain itself depends mainly upon the care exercised in the selection of seed. The collection of samples here reported on proves, however, that in almost every district excellent qualities of wheat may be already found. There is, therefore, no question of acclimatising seed imported from England or other countries, but simply of extending the area of the fine varieties already cultivated; and if a regular demand for the better qualities should spring up, there is every probability that the mere extension of the cultivation already existing would be able to meet it. As regards the condition of the wheat, the considerable quantities of chaff and dirt of all kinds, the presence of which depreciates the Indian wheat on the average by at least 2*s*. 6*d*. per quarter, could be easily removed by the introduction of comparatively simple screening and winnowing machinery.

The existing causes of depreciation of Indian wheat easily removable. Excellent seed may be found in almost every wheat-growing district.

Cheap winnowing and screening appliances.

12. The measures so far suggested are all capable of easy execution; and attention to the points mentioned would contribute to improve materially the position of Indian wheat in the English market. But in addition the introduction of steam-threshing machinery has recently been strongly recommended. No doubt, if such machinery came to be extensively adopted in India, the benefit derived from its use would be considerable. In view, however, of the great cost and general unsuitability of such machines to the Indian system of farming, it is impossible to entertain the hope that they could ever be adopted for general use in India. But it cannot be doubted that in some of the principal exporting districts such machines might be used with the greatest advantage. In addition to the clean condition of the grain, a great saving would be effected in the time required for the preparation of the crop for the market and its shipment to this country. In this manner the ravages of the weevil—one of the greatest obstacles to the development of the Indian wheat trade—would be reduced to a minimum; and Indian wheat could be delivered in this country just at that period, before the gathering of the English harvest, when stocks are lowest and prices at their highest. It may be mentioned that the introduction of

Advantages which would result from the introduction of threshing machines.

steam-threshing machinery into Russia, and quite recently into Egypt, has resulted in a considerable improvement in the quality of the wheat sent from these two countries.

Opening up of new markets for Indian wheat. The hard white wheat most suitable for Italy.

13. The suggestions contained in the preceding paragraphs bear upon the measures required for developing in India the production of a better quality of wheat than that now principally exported. But of equal importance to the increase of the supply of good wheat in India are any measures which might lead to an increased demand for the Indian wheats by the opening up of new markets. I may remark on this point that, in the opinion of the valuer to whom the samples were submitted, the Mediterranean would afford for some of the varieties a much better market than England. This applies particularly to a fine, hard, white wheat grown in many parts of India. Many of the samples of this kind sent from Bengal, the North-Western Provinces, but especially from Bombay, were equal to, if not better than, the finest Kubanka wheat, which is usually accepted as the type of the best wheat of this class. This kind of wheat is especially suited to the manufacture of macaroni, which is so important an industry in Genoa, Naples and other places in Italy. Hard white wheat is on this account in great request there, and may be frequently disposed of at prices much in advance of the London quotations. The difference in favour of Italy may sometimes amount to as much as 5*s*. per quarter. As, moreover, the shipping charges from India to Italy will be lower than those to England, that country seems to be the natural outlet for this description of Indian wheat, which up to the present has not been sufficiently appreciated in England.

Increased adaptability of the Indian wheat for the purposes of the English miller.

14. There is another point which has an important bearing on the demand for Indian wheat. Its consumption in this country depends mainly upon its adaptability for the purposes of the miller. It must be kept in mind that the recent remarkable development of the export trade in Indian wheat was to a considerable extent influenced by the improvements effected in this country in the mode of grinding it. This development was, of course, favoured by the opening of the Suez Canal and by other circumstances. But the principal cause was the discovery that by previous wetting Indian wheat is rendered perfectly suitable for grinding in the usual way, and also that an admixture of the dry Indian wheat with the English grain is very advantageous, especially after a wet harvest.

Recent improvements in milling machinery.

15. There is every reason to suppose that just as in the past changes or improvements in the milling process have affected the demand for Indian wheat, so in the future further improvements may result in increasing the demand. The improvements which have been effected during the last few years in milling machinery are very considerable. In addition to the usual system of grinding the grain by means of millstones, two new methods have been prominently brought into notice. The one consists in crushing the wheat by passing it repeatedly between chilled iron rollers. This is the method now universally used in Hungary,

and it produces the finest flour in the market. The superiority of the flour prepared in this way to that produced by the ordinary method is shown by the quotations which, for instance, on the 10th of February last ranged between 41*s*. and 55*s*. per sack of 280 lbs. of Hungarian flour, whilst the highest price for town-made flour was only 40*s*. The third and most recent system consists in a combination of the grindstones with crushing cylinders. The grain is first broken up between grindstones so as to convert it into a kind of semolina or suji, which is subsequently crushed between smooth porcelain cylinders.

Suggested experiments in order to ascertain capabilities of Indian wheat for the manufacture of the finest flour.

16. I had occasion to inspect the two new systems here referred to at the recent Paris Exhibition; and I concur with the opinion which has been expressed in the accompanying letter by Mr. Alexander Smith, of Cornhill, to whom I am indebted for the laborious series of valuations on which this report is founded, as to the expediency of ascertaining by direct experiment the suitability of the Indian wheat for the production of the finest flour with the aid of the new milling apparatus here referred to. Mr. Smith expresses his surprise at seeing so many specimens of really very fine wheats among the samples submitted to him. He says these extra fine wheats are unknown here, and that it would be of the utmost importance to get some of them converted into flour, and even into bread. He was particularly struck with the fine hard wheat, which he thinks is not sufficiently appreciated in this market; and he refers to some experiments undertaken some time ago, at his instance, with flour produced from the hard St. Petersburg wheat, which yielded per sack of 280lbs. 110 four-pound loaves of fine bread, whereas the best English wheat yields only 90 to 92 loaves. Some of the Indian samples of hard wheat are even finer than the best hard St. Petersburg or Kubanka wheat; and Mr. Smith is of opinion that the methods of milling recently introduced, in which the grindstones are replaced by crushing cylinders, will do away with the objection formerly entertained to the hard wheat on account of its being injurious to the grindstone.

For each milling experiment a quantity of about 20 quarters would be required; so that, to test the three systems of milling now in use, 60 quarters, or about 350 maunds, of each variety of wheat would have to be procured. Mr. Smith suggests that the following sorts should be tried:—

1*st*.—Fine hard white.	3*rd*.—Fine soft white.
2*nd*.—Fine soft red.	4*th*.—Good average soft white, No. 2.

Of these, the three sorts firstmentioned are not obtainable in the London market. The quality lastmentioned as "good average white, about No. 2," may indeed be purchased here; but it is often so much mixed and dirty, that it would be preferable to have it likewise imported directly from India.

It may be pointed out that the greater portion of the expenditure on account of such experiments would be recovered from the sale of the resulting flour.

Districts from which samples suitable for the experiments could be most readily obtained.

17. It should not be difficult to procure the quantities required of the wheats named for the proposed experiments. The lists of the best samples of each of the different varieties, and their place of

production, at pages 19 to 23 of the report (pages 259 to 265 of Selections) supply an indication of the places in which these varieties are obtainable. Although generally the best specimens of soft wheat are all produced north, and the best specimens of hard wheat south, of the Nerbudda, there are many districts in the North-Western Provinces or in the Central Provinces in which all the four varieties required may be found together. The finest specimens of hard white wheat comes from the Khandesh district in the Bombay Presidency; but wheat almost equal to it is found in many parts of the North-Western Provinces, and even as close to Calcutta as the Maldah district. The simplest way would be to entrust Mr. Buck, the Director of Agriculture of the North-Western Provinces, with the duty of purchasing the necessary quantities, approaching as nearly as possible the quality of the samples No. 1 or 2, Nos. 4, 6 and 7 of the set of samples which accompany this report, and the description of which is given in Appendix B, page 10 (page 246 of Selections). The districts of Cawnpore, Bulandshahr or Meerut appear the most suitable for such a purpose, as from each of them excellent samples of all four varieties have been received.

Request for a collection of fresh samples from the Punjab.

18. I would take the same opportunity for suggesting that a fresh collection of samples should be forwarded from the Punjab. As pointed on page 13 of the report (page 251 of Selections), the collection sent from that province would, in all probability, have scarcely done justice to it, even had it arrived uninjured. But by far the greater proportion of samples were either totally destroyed, or at least partially damaged by weevil. A number of most important wheat-growing districts are in consequence left unrepresented even by a single sample; and the whole province, containing 30 districts, and producing annually more than 10,000,000 quarters of wheat, or about as much as the whole United Kingdom, is only represented by 19 sound samples. From such scanty materials it is of course impossible to draw any reliable conclusions with regard to the character of the cultivation of wheat in the Punjab. Examples of the two extremes of Indian agriculture may be found there side by side. On the one hand, the specimen of soft white wheat sent from Delhi is the best sample in the whole collection, and several other samples are of equal excellence; on the other hand, there are a number of samples, among the red wheats especially, which could only have been grown from seed apparently degenerated through a long course of neglect. As observed in the report, the samples in question, in addition to foreign substances, contain a large proportion of grains of wheat of so stunted a growth and shrivelled appearance as to resemble rather grass-seed than a cultivated grain. The cultivation of such a degenerate wheat is the more astonishing as, to judge by our samples, seed of first-rate quality seems to be produced in the same or adjoining districts; so that the remedy for the evil is close at hand. One remark may be made on this subject. If the collection presents a fair picture of the varieties cultivated in the Punjab, then it must be inferred that the cultivation of wheat in the Punjab proper, that is, the districts between the Indus and the Sutlej, is conducted with considerably less skill and care than in the neighbouring North-Western Provinces. By far the

greater number of the samples sent from the Punjab districts consist of red wheat, frequently of a very inferior quality. In fact, the proportion of inferior samples is greater in the Punjab collection than in that from any other province, Madras, Mysore and Burma alone excepted, which can hardly be classed among the wheat-producing provinces. But on account of the incompleteness of the collection it would be hazardous to draw any definite conclusions.

Punjab probably destined to become the chief wheat exporting province of India.

19. The uncertainty in which the question of the quality of the Punjab wheats is left is the more a matter of regret, as that province seems capable of becoming the chief wheat-exporting district of India. As I had occasion recently to point out, there is no part of India in which, in proportion to the population, wheat is grown to the same extent as in the Punjab, the acreage now under wheat amounting to more than 6,000,000 acres, and being capable of rapid extension.

Hitherto the only railway available for the wheat coming from the Punjab has been the Punjab and Delhi and the East Indian line, so that the producing districts were at a distance of from 1,100 to 1,500 miles from the port (Calcutta).

By the Indus Valley Railway the distance to the port (Kurrachee) will only amount to from 600 to 1,000 miles. The reduction in the railway carriage will thus be considerable, amounting on the average to about 6*s.* per quarter. There will be a further saving of 2*s.* per quarter on the freight from Kurrachee to London as compared with the freight from Calcutta to London. The total saving effected by the Kurrachee route will thus amount to about 8*s.* per quarter, and the total expense of carriage and freight to London will be from 15*s.* to 20*s.* per quarter.* Considering that the price of wheat in London may be taken

* The saving on the inland carriage has been made on the basis of the special reduced rate for long distances now charged on the East Indian Railway, *viz.*, 18·7 pies per 100 maunds. The rates on the Sind, Punjab and Delhi line, parts of which would have to be used both in exporting *vid* Calcutta as well as *vid* Kurrachee, are a little higher, *viz.*, 25 pies per 100 maunds. For the purpose of a rough calculation, however, it will be sufficient to adopt the East Indian Railway rate of 18·7 pies for the whole distance; especially as it may be presumed that with an increased wheat traffic the Sind, Punjab and Delhi Railway would bring down its rates to the lower level.

	Punjab to London, *vid* Kurrachee.				Punjab to London, *vid* Calcutta.			
	Minimum distance, 600 miles (Mooltan).		Maximum distance, 1,000 miles (Umballa or Rawalpindi).		Minimum distance, 1,100 miles (Umballa).		Maximum distance, 1,500 miles (Mooltan or Rawalpindi).	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
Carriage by rail to the port, per quarter ...	6	10	11	5	12	6	17	2
Freight by sea to London, per quarter ...	8	0	8	0	10	0	10	0

This shows an advantage of 5*s.* 8*d.* on the railway carriage and 2*s.* on the sea freight, or nearly 8*s.* per quarter in favour of the Kurrachee route.

As the Indus Valley Railway is almost finished, with the exception of the bridge at Sukkur, experience will shortly show whether the line will be able to convey as large quantities of merchandise at rates as low as those now charged on the East Indian line; and it is only the inability of the Indus Valley Railway to accomplish this which would affect the above forecast.

at the present time at from 40*s*. to 45*s*. per quarter, and that in the Punjab in normal years the prices range from Rs. 9 to 14 for the same quantity, a saving of 8*s*. will often make the whole difference between a profitable and a losing trade; that is, between a trade of the largest dimensions and no trade at all.

The completion of the Indus Valley Railway is thus calculated to bring about a complete revolution in the wheat trade of India, which is likely to assume in the Punjab a magnitude considerably greater than that which it is likely to attain in the districts from which the wheat is at present exported.

These few observations on the special interest attaching to the exact knowledge of the varieties of wheat cultivated in the Punjab will, I trust, be considered to justify the adoption of the suggestion made above for the collection of a new set of samples in that province.

Suggested chemical analysis of the principal varieties of Indian wheat.

20. I beg likewise to suggest that it is very desirable to obtain a detailed chemical analysis of the chief varieties of wheat referred to in the accompanying report. An opinion has been recently expressed that a proof is afforded of the exhaustion of Indian soils by the very low percentages of phosphoric acid contained in the ash of the Indian wheats. It would be desirable to test the correctness of this opinion. A detailed analysis would further show whether the difference in quality between hard and soft wheat is due to a difference in chemical composition, the hard wheat appearing to be much richer in nitrogenous matter than the soft wheat. All these various points could be satisfactorily settled by analysing samples of the four different varieties, soft white, soft red, hard white, and hard red. For the sake of comparison, samples of English wheats and of Australian and Californian should be analysed at the same time.

Request for the statistical information collected in India with regard to wheat.

21. In conclusion, I beg to refer again to the great importance of obtaining from India the detailed statistical information which has been collected under the orders of the Government of India mentioned at the beginning of this memorandum. This information is urgently required to complete that which is afforded by the direct examination of the samples; and only after its receipt will it be possible to compile a complete and reliable account of the cultivation of wheat in India—an account which, under the present circumstances, would be exceedingly useful both to the Government and to the mercantile community.

APPENDIX A.

Table showing for each Province, as also for all India, the number of samples forwarded by the Government of India of wheat of each of the several varieties, together with their range in price, taken at the beginning of February 1879.

Note.—The classification, according to price, adopted in this Table, applies, strictly speaking, only to the soft white wheats. It has been extended to the three other varieties in order to give a general idea of the number of samples of all varieties comprised within the same range of prices.

Description of Wheat.	NUMBER OF SAMPLES FROM THE UNDERMENTIONED PROVINCES.										
	Bengal.	North-Western Provinces and Oudh.	Ajmere and Merwara.	Punjab.	Sind.	Bombay.	Central Provinces.	Berar.	Madras.	Mysore.	Burma.	All India.
A.—Soft and semi-hard white wheat, or mixed with predominance of soft white.												
Superior samples 44*s.* to 48*s.* per quarter ...	6	81	...	7	...	...	7	...	...	...	...	101
Grade No. I 41*s.* 6*d.* to 43*s.* 6*d.* ,, ...	9	96	...	4	8	3	3	...	...	...	...	123
Grade No. II 39*s.* 6*d.* to 41*s.* ,, ...	5	44	...	4	14	2	4	...	...	...	...	73
Ordinary 37 to 39*s.* ,, ...	5	26	...	1	17	...	2	...	...	...	...	51
Inferior below 37*s.* ,, ...	2	4	...	1	2	...	...	...	...	...	...	9
Total soft white samples ...	27	251	...	17	41	5	16	...	...	...	...	357
Average price per quarter ...	*s. d.* 41 4	*s. d.* 42 0	*s. d.* ...	*s. d.* 42 8	*s. d.* 39 8	*s. d.* 42 1	*s. d.* 43 3	*s. d.* ...	*s. d.* ...	*s. d.* ...	*s. d.* ...	*s. d.* 41 9
B.—Hard white wheat.												
Grade No. I 41*s.* 6*d.* to 43*s.* 6*d.* per quarter...	3	5	...	...	...	3	...	2	...	...	...	13
Grade No. II 39*s.* 6*d.* to 41*s.* ,, ...	4	23	1	2	...	29	5	19	...	...	...	83
Ordinary 37*s.* to 39*s.* ,, ...	5	8	...	...	8	27	3	10	...	...	...	61
Inferior below 37*s.* ,, ...	...	1	...	1	7	1	...	...	...	...	...	10
Total hard white samples ...	12	37	1	3	15	60	8	31	...	...	...	167
Average price per quarter ...	*s. d.* 39 10	*s. d.* 40 1	*s. d.* 40 0	*s. d.* 38 0	*s. d.* 37 2	*s. d.* 39 5	*s. d.* 39 6	*s. d.* 39 8	*s. d.* ...	*s. d.* ...	*s. d.* ...	*s. d.* 39 5
C.—Soft and semi-hard red wheat, or mixed with predominance of soft red.												
Grade No. I 41*s.* 6*d.* to 43*s.* 6*d.* per quarter ...	3	2	2	2	...	...	1	...	...	...	...	10
Grade No. II 39*s.* 6*d.* to 41*s.* ,, ...	11	23	1	7	1	8	2	3	...	...	...	56
Ordinary 37*s.* to 39*s.* ,, ...	6	38	...	11	...	5	10	4	...	...	...	74
Inferior below 37*s.* ,, ...	1	8	...	10	1	...	...	...	...	...	...	20
Total soft red samples ...	21	71	3	30	2	13	13	7	...	...	...	160
Average price per quarter ...	*s. d.* 39 7	*s. d.* 38 4	*s. d.* 41 8	*s. d.* 36 8	*s. d.* 37 9	*s. d.* 39 8	*s. d.* 39 1	*s. d.* 39 3	*s. d.* ...	*s. d.* ...	*s. d.* ...	*s. d.* 38 5
D.—Hard red wheat.												
Ordinary 37*s.* to 39*s.* per quarter	2	4	1	...	...	31	11	13	5	1	...	68
Inferior below 37*s.* ,, ...	6	11	...	4	...	30	1	3	13	5	2	75
Total hard red samples ...	8	15	1	4	...	61	12	16	18	6	2	143
Average price per quarter ...	*s. d.* 35 10	*s. d.* 33 10	*s. d.* 37 6	*s. d.* 33 0	*s. d.* ...	*s. d.* 36 9	*s. d.* 37 4	*s. d.* 37 0	*s. d.* 36 1	*s. d.* 32 4	*s. d.* 34 3	*s. d.* 36 1
All varieties.												
Superior samples 44*s.* to 48*s.* per quarter ...	6	81	...	7	...	...	7	...	...	...	...	101
Grade No. I 41*s.* 6*d.* to 43*s.* 6*d.* ,, ...	15	103	2	6	8	6	4	2	...	...	...	146
Grade No. II 39*s.* 6*d.* to 41*s.* ,, ...	20	90	2	13	15	39	11	22	...	...	...	212
Ordinary 37*s.* to 39*s.* ,, ...	18	76	1	12	25	63	26	27	5	1	...	254
Inferior below 37*s.* ,, ...	9	24	...	16	10	31	1	3	13	5	2	114
Total number of samples ...	68	374	5	54	58	139	49	54	18	6	2	827
Average price per quarter of 496lbs. ...	*s. d.* 39 10	*s. d.* 40 9	*s. d.* 40 6	*s. d.* 38 5	*s. d.* 39 0	*s. d.* 38 3	*s. d.* 40 1	*s. d.* 38 10	*s. d.* 36 1	*s. d.* 32 4	*s. d.* 34 3	*s. d.* 39 8

Appendix B.

*Typical collection of samples illustrating the principal varieties of wheat grown in India.**

Nos. 1 *and* 2.—Samples of the finest kind of soft white wheat, equal to the best Australian. No. 1 is a sample of wheat grown near Delhi (safed No. 273), and is the best of all as regards colour and shape of grain, but as regards softness it is excelled by the second sample, grown in the Meerut district (safed No. 397). Both were valued at the highest figure of any wheat at the time (February 1879) in the London market, *viz.*, 48*s.* per quarter, and the weight per bushel is high, 65lbs. in the case of the first, and 62lbs. in that of the second sample. Samples approaching these two in quality were received from about 60 districts, comprising the greater part of Behar, the North-Western Provinces and Oudh, the Central Provinces, the Punjab and Sind.

No. 3.—Sample of good wheat, grade No. I, grown in the Sultanpur district of Oudh (samdhara No. 711), and valued at 43*s.* 6*d.* per quarter.

No. 4.—Sample of good average wheat, grade No. II, or rather better, grown in the Chumparun district of Behar (bada No. 154), valued at 40*s.* 6*d.* per quarter, and weighing 61 lbs. per bushel. This sample, like the previous one, differs from the two samples placed first by being mixed with a certain proportion of red and hard wheat, and is less uniform in appearance and colour than the best soft wheats placed first. These two specimens represent the two most numerous classes of the samples of soft white wheats in the present collection.

No. 5.—Sample of a peculiar wheat, resembling pearl barley in appearance, grown in the Meerut district (chunia No. 401), valued at 43*s.* 6*d.* per quarter; weight 63½ lbs. per bushel. This specimen is included rather as a curiosity; the variety it represents being cultivated only locally in some parts of the North-Western Provinces, Oudh, the Punjab and Sind.

No. 6.—Sample of fine hard white wheat, equal to the best St. Petersburg or Kubanka, grown in the Khandesh district (bansi No. 605), valued at 42*s.* 6*d.* per quarter, and weighing 62½ lbs. per bushel. Wheat of similar quality is cultivated throughout the Deccan and Berar. Excellent samples were also sent from the North-Western Provinces, Oudh and Bengal. This kind is most in request in Italy for the manufacture of macaroni, where it would fetch a considerably higher price than in this market.

No. 7.—Sample of fine soft red, grown in Ajmere (baja maigi No. 588), valued at 41*s.* 6*d.* per quarter, and weighing 61 lbs. per bushel. Wheat of similar quality may be found almost throughout the whole of Northern India, and as far south as Berar.

No. 8.—Sample of hard red wheat, grown in Guzerat (No. 1*a*), valued at 37*s.* 6*d.* per quarter. This variety is very unsuitable for the European market, and its growth should not be encouraged. It is found

* A certain number of duplicates of the collection here referred to have been forwarded to India with the copies of this report.

mainly in the Peninsula, or south of the Nerbudda, as far as Mysore and Tinnevelly; and its prevalence usually indicates the unsuitability of that part of the country for the production of the better kinds of wheat.

No. 9.—A specimen of degenerate red wheat, from the Kurnool district in the Punjab (gehun lal No. 260), valued at 31*s.* 6*d.*, is included in this collection as an example, and by no means the worst example, in the present collection, of a grain the cultivation of which should be discouraged. It weighs only 53½ lbs. per bushel.

Report on the samples.

1. The samples of wheat which the Government of India in their Resolution of 14th March 1877 directed to be forwarded to the Secretary of State for India for valuation and report were received at various dates during the years 1877 and 1878 as enclosures to the despatches noted in the margin, the final consignment of samples having been received only in December last. The total number of samples forwarded amounted to 1,152; and these were contributed by the different provinces in the following proportion :—

No. 32 of 6th August 1877.
„ 35 „ 27th „ „
„ 37 „ 27th September „
„ 39 „ 8th November „
„ 40 „ 7th December „
„ 2 „ 18th January 1878.
„ 8 „ 22nd March „
„ 13 „ 15th July „
„ 17 „ 29th „ „
„ 23 „ 31st October „

Bengal	117	samples.
North-Western Provinces and Oudh	448	„
Ajmere and Merwara ...	8	„
Punjab	101	„
Sind	122	„
Bombay	172	„
Central Provinces	69	„
Berar	58	„
Madras	29	„
Mysore	26	„
Burma	2	„
Total ...	1,152	„

In addition to the collection of samples, the Government of India in the Resolution above referred to directed the collection of statistical details on the subject of wheat. Until that information arrives, it would be useless to undertake the elaboration of the very imperfect materials at present available. No attempt therefore has been made to give a statistical account of the cultivation of wheat in India, and the present report will contain solely the results of the examination of the samples sent to this country.

2. *Condition of the samples.*—The condition in which the sampesl arrived here illustrates one of the principal difficulties of the Indian wheat trade. As will be seen from the figures noted below—

Name of Province.	Total Number of samples.	Number of samples destroyed by weevil, lost, or otherwise unfit for valuation.	Number of samples valued	
			In a more or less weevilled condition.	In a sound or nearly sound condition.
Bengal	117	49	21	47
North-Western Provinces and Oudh	448	74	134	240
Ajmere and Merwara ...	8	3	2	3
Punjab	101	47	35	19
Sind	122	64	58	...
Bombay	172	33	34	105
Central Provinces ...	69	20	9	40
Berar	58	4	23	31
Madras	29	11*	13	5
Mysore	26	20*	1	5
Burma	2	...	...	2
Total ...	1,152	325	330	497

more than one-half of all the samples were found on arrival to be more or less damaged by weevil. Of the 325 samples entered as lost or otherwise unfit for valuation, a few were sent in quantities insufficient for examination; others (from Madras and Mysore) were forwarded unhusked; some were lost owing to injury in transit to the bag or case containing the samples; but the great majority were found to be unfit for valuation; on account of excessive weevilling. Thus only 827 samples were left for valuation, and even of these, 330 samples were more or less damaged by weevil, though not to such an extent as to render a valuation entirely misleading. Only 497 samples out of a total of 1,152 were in a perfectly sound, or at any rate nearly sound, condition.

Some provinces are much worse off in this respect than others. Thus in the case of Sind, out of 122 samples, there was not one perfectly sound, although 58 were still in a tolerably fit condition for valuation. Out of the 101 samples sent from the Punjab, almost one-half, *viz.*, 47, were unfit for valuation; and of the remainder only 19 were perfectly sound, whilst 35 were more or less weevilled. It is clear that from this reason the valuation of the Sind and Punjab series of samples will show a rather lower range of prices than would have been obtained if all the samples had been sound. The samples from Bombay and the Central Provinces are those which, on the whole, were

* Three of the Madras and 15 of the Mysore samples were evidently of the nature of spelt with the husk adhering to the grain. They were all reported on as unmarketable in this country, and would require to be husked in the same way as paddy.

received in the best condition, considerably more than one-half of all the samples having remained perfectly sound.

The causes of this excessive damage by weevil are not far to seek. The best way of preventing this damage would have been to have collected the samples as soon as possible after harvest, and to have forwarded them to London by the quickest route. It appears, however, from an examination of the dates, that most of the samples were collected a considerable time after harvest, and that their arrival in London was still further delayed by their being forwarded in the first instance to Calcutta. It is probable indeed that many of the samples were already weevilled before they left India. The Bengal samples, for instance, were packed each in a hermetically sealed tin case, so that no weevil could have found access to them during the voyage; and yet, out of 117 samples, 70 arrived more or less weevilled. It should be suggested that in future any samples of wheat or other grain to be forwarded to this country for valuation should be collected immediately after the harvest and despatched direct to London. The parcel post will be found, on the whole, to supply the quickest, most convenient and most economical mode of forwarding them.

It may be further remarked that, in order to obtain a fair valuation, it is necessary to have a sufficient quantity of the material for ascertaining the weight per bushel—a very important determination. Many of the samples forwarded, especially in the second consignment from the North-Western Provinces, were quite insufficient for this purpose, in some cases not exceeding two ounces; whereas at least one pound is required.

3. *Extent of wheat cultivation in India.*—Taken as they stand, the collection of samples here reported on still affords the most complete representation of the cultivation of wheat in India which has been brought together up to the present time. As will be seen from the numbers already given in the previous paragraphs, every province of India is represented in the collection. Samples appear from every district which is known to produce wheat in any considerable quantity. If any wheat is cultivated at all in the districts which are not represented, all the information at our disposal leads to the inference that such cultivation is quite exceptional and insignificant in amount. The districts therefore from which samples have been sent may be assumed, without any important error, to represent the area within which wheat is cultivated in India. This area comprises by far the greater part of the country. It extends throughout every district of the North-Western Provinces, Oudh, the Punjab, Sind, the Central Provinces and Berar. In the Bombay Presidency samples were received from every part, with the exception of some of the coast districts. Similarly the few samples received from the Madras Presidency were sent mainly from some of the interior districts, scarcely any coming from the districts near the coast. In the Lower Provinces of Bengal all the districts comprised within the limits of Behar are represented by samples; but in Bengal proper hardly any are sent from the districts within the Gangetic delta or those adjoining the Brahmaputra; and the cultivation of wheat

seems to be restricted to the more or less hilly parts south and west of the Ganges, the Maldah district being the only one on the other side of the river from which any fair samples of wheat were forwarded. The area of wheat cultivation in India may be thus defined as the whole of Northern India up to the Gangetic delta, and in Southern India the whole of the tableland above the Ghâts. From British Burma only two samples were sent; and its cultivation there is evidently quite exceptional.

The collection of samples is less complete in the case of some of the provinces than of others, and is still further diminished by the loss or damage from weevil, which has already been referred to. The most complete collection of samples were sent from the North-Western Provinces and Oude, from which 448 samples were received; so that, notwithstanding the usual loss of some of the samples from weevil, there is from almost every district an ample supply of sound samples representing the varieties of wheat usually cultivated in it. But in the case of almost every other province repeated instances occur in which all the samples from a particular district have been destroyed. Such is the case, for instance, with the Purneah district and the Sonthal Pergunnahs in Bengal, the Amritsar, Rawalpindi, Montgomery and other districts of the Punjab, the Surat and Ahmednagar districts of the Bombay Presidency, the Jubbulpore district of the Central Provinces, and some others. Again many districts are represented only by samples more or less weevilled, others by only inferior specimens of wheat, all the softer, and therefore more valuable, samples having been rendered unfit for valuation by excessive weevilling. But in most cases enough samples remain from the surrounding districts to enable one to infer with tolerable certainty the nature of the wheat cultivated in the districts from which a deficient supply was obtained. The most notable exception occurs in the Punjab. Even if the whole collection had arrived uninjured, it would have hardly done justice to that province, which, in proportion to its area and population, possesses the largest cultivation of wheat in India, and which, as shown at page 7 (page 243 of Selections) of this paper, there are grounds for thinking, may, before long, become one of the most important centres of the export of wheat from that country. From the districts of the Punjab proper, beyond the Sutlej, in one-half of the instances only one sample was sent per district; although there is no reason to suppose that the wheats grown in the Punjab present a smaller range of varieties than those cultivated in other parts of India. The Punjab collection must therefore have been far from complete, even as sent from India; but as in addition it has suffered more from weevil than that of any other province, Sind alone excepted it affords only a very imperfect idea of the cultivation of wheat in the Punjab. A collection of 19 sound samples can hardly be considered to adequately represent a province containing 30 districts, and producing annually more than 10 million quarters of wheat, or about as much as the United Kingdom.

4. *Native names of the different varieties.*—Considerable confusion exists with regard to the native names of the different varieties of wheat. Many samples from Bombay and the Punjab had no names

at all attached to them. Others are only distinguished as red or white wheat, or by similar generic designations in native languages, such as "safed" (white), "lal" (red), "surkh" (brick colour), "safed gehun" (white wheat), "lal gehun" (red wheat). The other Hindi, Persian or Sanskrit synonyms for wheat, "kunuk," "gundum" or "saman," are also frequently employed, either alone or in connexion with the adjectives designating white or red. Whether by mistake or otherwise, the names appear sometimes to be misapplied. Thus, for instance, two samples called "lalia" (valuation Nos. 349. and 696) from Sitapur consist of fine, soft, white wheat. In the same manner, "lal disi" (No. 146) from Muzaffarpur, "kathia lalia" (No. 329) from Fyzabad, "lalia" (No. 478) from Lucknow, "lal pissia" (No. 504) from Etawah, and some other samples similarly described, are all white, notwithstanding the use of the adjective "lal," or red. On the other hand, a "white pissi" (No. 565) from Bilaspur is described by the valuer as a good, soft, dingy red.

In addition to these generic designations, many specific names occur, which at first one would be inclined to consider as applying each to some well-known variety of wheat with well-defined characteristics. To a certain extent this seems to be the case. For instance, spread over all India from the Punjab to Bengal and south as far as the Deccan, appear names like the following—daudi, dudhia, dawudi, daudkhani, dudhia, which all seem to be derived from the same original name, "dawud khani" (Prince David's wheat). Throughout the Gangetic valley the samples sent under these names are of a nearly uniform character, almost invariably white and soft, and frequently of a very superior quality; but occasionally, and especially in the Deccan, a very inferior hard white wheat will go under this name. Another widespread series of names which appear to apply to the same description of wheat are the names mundi, mundia, mundwa, mandwa, mondha, mendha, which appear to be equivalent with muria, marua, marwa, muria, ratua, and ratta, ratwa, ratua, as also with ujra. These names occur throughout the North-Western Provinces and Oudh, as also in the adjoining portion of the Central Provinces, such as "pissi mundi." They apply almost invariably to a beautiful, soft, white wheat, as a rule of a very high quality. The same holds good of seta, sitia, setwa, and satwa, as also of saman bargehuna, sambhari, sambharia, or samaria—names which are frequently met with in the same districts as the above. The name "pissi," frequently used in the Central Provinces, and occasionally in the North-Western Provinces, seems invariably to imply a softness of grain, whether in white or red wheat.

But in the case of almost every other name samples of the most different character may be found. Thus, for instance, the names gajar, gajra, gaja, designate, as a rule, in the Agra and Rohilkhand divisions and adjoining parts of Oudh rather an inferior sort of white wheat. Very frequently the wheat is mixed, white and red, sometimes altogether red; but occasionally samples are to be found under the same name, consisting of the finest soft white wheat, equal in value to the best specimens produced in India. The same applies to the names kathia, katteh, kuttya and other variations, which in most parts of India

designate rather a poor sort of wheat, white or red, but mostly hard; and yet occasionally have been applied to the most beautiful samples of soft white. The names jamali and gungajoli so frequently met are indiscriminately applied to wheat of the most different characteristics.

It may indeed frequently happen that, even in cases in which the grain is of a different hardness or colour, the plant known under the same name may be distinguished by a certain similarity in outward appearance, and that only the character of the seed has become changed or degenerated. It is impossible to decide this point without possessing specimens of the whole plant. But sufficient evidence has been shown of the uncertain meaning of the native names as applied to the grain itself, to make it unsafe to adopt them as a basis of a commercial grouping of the samples sent from India. This has been therefore effected entirely on the basis of the appearance of the samples themselves, without regard to the names under which they were sent.

5. *Description of the principal varieties of wheat grown in India.*— The whole of the 827 samples submitted for valuation may be arranged in four principal groups, embracing the white soft, the white hard, the red soft, and the red hard wheat. The differences between these varieties, when pure, are very striking.

The pure soft white wheat has a grain usually of a bright straw colour, is opaque in appearance, and the fracture is white and floury, the inner portion of the grain being friable. This is the most valuable variety for the London market, as it yields the finest flour. The Indian wheat of this description is in special request on account of its dryness, which renders it useful for admixture with home-grown wheat containing too much moisture when harvested in wet seasons. It is also liked by millers, on account of the considerable increase in weight which it experiences in grinding in consequence of its power of absorbing moisture.

The pure hard white wheat has a grain of a translucent, flinty or "ricey," appearance, varying in colour from a greyish or yellowish white to the lighter shades of brown, the fracture smooth and glass-like, and the grain hard and brittle. This kind of wheat is not much in favour in the London market, as the usual appliances of English millers do not seem to be so well adapted for dealing with it as with the soft white. It is, however, in considerable request in the Mediterranean, and especially in Italy, where it is used in the manufacture of macaroni. This is the reason why the quotation in Italy for wheat of this description is frequently as much as 5*s*. per quarter higher than that of the London market.

The pure soft red wheat is only distinguished from the soft white by the different colour of the skin, which varies in different varieties from an amber colour to a reddish brown. The fracture is as white and mealy as in the soft white wheat, and the grain as friable. It is eminently suitable for the English market. The Indian red varieties are, however, frequently rather smaller berried than the white varieties, and are usually much deteriorated by being mixed with barley, gram and different oil-seeds.

The hard red wheat is the darkest of any, being frequently of a dark-brown colour. It is translucent in appearance, and the fracture is smooth and glass-like. It occupies the lowest position in the London market, as it is generally disliked by the millers.

Only a certain number of the samples, however, present these characteristics with distinctness. A considerable number consist of mixtures of the primary varieties in all possible proportions, white and red, soft and hard, from which the grains of each kind may be picked out. A considerable number, too, though consisting of grain of uniform quality, exhibit in the character of the individual grain a transition between some of the four varieties abovementioned. For instance, in certain samples of the Bansi wheat from the Central Provinces some portions of the same individual grain may be opaque and soft, others translucent and hard. In the same way many of the samples of wheat from the Punjab and from Bengal, although in general approaching in appearance the soft white wheat, are yet considerably harder than the pure soft wheat, and yet not hard enough to be classed with the hard wheat. These were usually described as semi-hard, and are in general classed with the soft white wheats. The same may be remarked even more frequently of red wheat, in which perhaps the greater number of samples is neither completely soft nor yet decidedly hard. In colour, again, the hard white passes by imperceptible transitions into the hard red, as there are many specimens of a light-brown translucent grain which might be arbitrarily classed with either the hard red or with the hard white variety.

For the purpose of a simple classification, however, all the samples have been arranged in four groups, corresponding to the four distinctive varieties, the mixed or transitional samples being added to the group with the character of which they most nearly corresponded. Thus all the semi-hard white wheats, or mixed wheats in which the soft white variety predominated, have been included in the same group with soft white. A peculiar description of short round berried wheat, in appearance like pearl barley, with a hardness considerably in excess of the usual soft wheat, has been likewise included with it. In the same manner most of the semi-hard red and brown wheats are included in the same group with soft red. The number of samples contained in each group appears from the following enumeration; the average price assigned to each group has been added in order to show in this way the relative estimation in which the different descriptions stand in the London market:—

	Number of samples.	Average price per quarter of 496 lbs.
		s. d.
1. White, soft and semi-hard, and pure or mixed, with a predominance of soft white.	357	41 9
2. Hard white	167	39 5
3. Red, soft and semi-hard; pure or mixed, with a predominance of soft red.	161	38 5
4. Hard red	142	36 1
Total ...	827	39 8

The number of samples classed with soft white and soft red amounts to 518, against 309 of hard white and hard red samples, showing a considerable predominance of soft samples, even when taking into account that, among the inferior varieties of the samples grouped with the soft wheat, there are many semi-hard samples or samples of soft wheat largely mixed with hard grain. The great number of soft samples is an important fact, as it is the soft wheat which is most suitable for export to this country, as appears from the higher price realised by it.

6. *Geographical distribution of the different varieties of Indian wheat.* —To a certain extent, the four distinctive varieties, the soft and hard white, and the soft and hard red, are cultivated side by side in the same districts; but, on the whole, a distinct geographical distribution of the several varieties may be perceived. In the accompanying map* the leading varieties of wheat produced by each district have been separately marked, and it clearly appears that, while Northern India produces mainly soft wheats, the samples produced in Southern India and part of Bengal are chiefly hard. The cultivation of the soft white wheat appears to be comprised within the basins of the three great rivers, the Ganges, the Indus, the Nerbudda, and their tributaries. In fact, from the whole territory south of the Nerbudda basin only two samples of soft white wheat were sent—one from Khandesh on the Tapti, only a little south of the Nerbudda, and a sample of mixed soft red and white, from the Belgaum district. Whilst the North-Western Provinces and Oudh sent mainly soft white samples, the majority of the samples from the Punjab are soft red. The soft red wheat also extends farther south than the soft white. Several fine samples were sent from Berar, from which not a single sample of soft white wheat arrived, and a sample (all but destroyed by weevil) came from as far south as Bellary. The hard white wheat occurs occasionally wherever the soft white is cultivated, but it is predominant in the Deccan, Berar and parts of Bengal. The least valuable variety, the hard red wheat, extends the farthest to the south of all, and is, moreover, the only kind cultivated in the moist climate of the Gangetic delta, Orissa and Burma. In the extreme south of the Madras Presidency and in Mysore the wheat appears to belong to a variety similar to the spelt, in which the husk adheres so strongly to the grain, that mere threshing is insufficient to separate them, so that it requires to be husked in the same way as paddy. The grain appears to be of an inferior hard red description.

In the following table, the predominant character of the wheat culture in each province is shown by the number of samples of each of the four kinds of wheat sent from them, whilst the average price for each province illustrates the influence which the cultivation of the more

* This map does not pretend to do more than give a general idea of the production of wheat in India, and of the manner in which information on this subject can be represented after the receipt of the complete statistics now in process of being collected.

valuable soft and white varieties exercises on the value of the whole provincial produce :—

Name of Province.	Number of samples of				Total number of samples.	Average price per quarter of 496lbs.	
	Soft white.	Soft red.	Hard white.	Hard red.		*s.*	*d.*
Bengal	27	21	12	8	68	39	10
North-Western Provinces and Oudh.	251	71	37	15	374	40	9
Ajmere and Merwara ...	...	3	1	1	5	40	6
Punjab	17	30	3	4	54	38	5
Sind	41	2	15	...	58	39	0
Bombay	5	13	60	61	139	38	3
Central Provinces ...	16	13	8	12	49	40	1
Berar	...	7	31	16	54	38	10
Madras	...	...	...	18	18	36	1
Mysore	...	...	...	6	6	32	4
Burma	...	...	...	2	2	34	3
All India ...	357	160	167	143	827	39	8

It appears from this table that the greatest preponderance of soft white samples occurs in the North-Western Provinces and Oudh, 251 samples out of 374 belonging to this class. The average value of the samples from this province is therefore the highest of any in India, amounting to 40*s.* 9*d.* per quarter of 496 lbs. The two provinces in which the soft white likewise constitutes an important fraction of the samples, *viz.*, the Central Provinces and Bengal, realise also the next highest average values, *viz.*, about 40*s.* per quarter. The Punjab would almost certainly have shown an equal, if not a higher, value if the collection from it had been more complete; and the same would probably have applied to Sind, if the samples from there had not been weevilled throughout, in addition to being mixed frequently with barley and other grains. All the other provinces have a lower average, the lowest occurring in the case of Madras, Mysore and Burma, all the samples coming from which belong to the hard red description.

The detailed description and valuation of the samples is contained in the accompanying valuation list, pages 26 *et seq.* (pages 270 *et seq.* of Selections), in which the samples are arranged according to the districts from which they were forwarded. The provinces are arranged in sequence, starting from Calcutta. First come the Lower Provinces of Bengal, followed by the North-Western Provinces and Oudh, by Ajmere and Merwara, and the Punjab. Then follows Sind, in the Bombay Presidency, and the Bombay districts proper. Next follow the Central Provinces, Berar, Madras, Mysore, and at last Burma. Within each province the divisions follow in their geographical, and the sub-divisions or districts in alphabetical, order. The samples within each district are grouped according to the four varieties, soft white, hard white, soft red, and hard red; the best samples

of each description coming first, and then the others in the order of their value. In order to facilitate reference, and to be able to estimate at a glance the comparative frequency of the samples of each description of wheat, each entry is prominently distinguished by a mark consisting of one or more of the four letters A, B, C, D. The letter A stands for soft white, B for hard white, C for soft red, and D for hard red; whilst combinations of the letters indicate mixtures, in which the letter placed first points to the predominant variety. For instance, A D designates a mixture of soft white with hard red wheat, the soft white preponderating. The valuations of all the samples are strictly comparable with each other, although they were originally made at different periods, in the order of the arrival of the samples from India. At the time of the valuation of the last consignment, in February of this year, a certain number of samples of the first consignment were re-valued, and rules were agreed upon for reducing the prices of the previous valuations to the level of the last quotations, and these reduced prices only were finally entered. It must be remarked that in the course of the arrangement of all the samples district by district, and in the order of their quality, the running numbers of the original valuation lists, which followed each other in the order of the arrival of the samples, were considerably disarranged, because samples from the same district may have arrived in several batches at very different times, and were placed at very different places in the original valuation list, whilst they are all placed together in the list now submitted. Whenever possible, the local number of the sample has been likewise entered. Most of the consignments, however, arrived without any list or local numbers whatever, and can only be identified by their name and the place they were sent from.

Observations on the samples of soft white wheat.

7. *Soft white wheat.*—The quality of the samples of white wheat forwarded to this country is, on the whole, surprisingly high; and Mr. Alexander Smith, to whom they were submitted, reports that a considerable number amongst them are far superior to any Indian wheat ever seen in the London market. The better qualities of wheat coming from Calcutta are usually comprised under the classes No. 1 and No. 2 club, the quotations for which at the time of the last valuations, in the beginning of February of this year, were 42*s.* to 43*s.* for No. 1, and 40*s.* to 41*s.* for No. 2. By adding the samples which depart only a little from these values to the numbers contained within the above classes, and by distinguishing those either above or below them in value, the samples of soft white wheat may be arranged in the following five classes:—

		Price per quarter of 496 lbs.
(*a*)	Samples of superior quality ...	44*s.* to 48*s.*
(*b*)	„ grade No. 1 ...	43*s.* 6*d.* to 41*s.* 6*d.*
(*c*)	„ „ No. 2 ...	39*s.* 6*d.* to 41*s.*
(*d*)	„ ordinary quality	37*s.* to 39*s.*
(*e*)	Inferior samples ...	below 37*s.*

The number of samples belonging to each class will appear from the following statement:—

Name of Province.	Number of samples of soft white wheat (including mixed and semi-hard, with predominance of soft white) of each of the classes undermentioned.					
	Superior quality, 44s. to 48s. per quarter of 496 lbs.	No. 1 club, 43s. 6d to 41s. 6d. per quarter of 496 lbs.	No. 2 club, 39s. 6d. to 41s. per quarter of 496 lbs.	Ordinary quality 37s. to 39s. per quarter of 496 lbs.	Inferior quality, below 37s. per quarter of 496 lbs.	Total.
Bengal	6	9	5	5	2	27
North-Western Provinces and Oudh.	81	96	44	26	4	251
Ajmere and Merwara ...	...	...	...	...	...	...
Punjab	7	4	4	1	1	17
Sind	...	8	14	17	2	41
Bombay	...	3	2	...	...	5
Central Provinces ...	7	3	4	2	...	16
Berar	...	...	...	...	...	...
Madras	...	...	...	...	...	...
Mysore	...	...	...	...	...	...
Burma	...	...	...	...	...	...
All India ...	101	123	73	51	9	357

Thus, out of a total of 357 samples, more than 100 samples are better than grade No. 1, and more than 120 samples come up to that grade. The result would have been even more favourable if a certain proportion of the samples had not been to some extent damaged by weevil.

Four different types of grain may be distinguished among the samples of soft white wheat. These are—

(*a*) Wheat similar to Australian or Californian, stout regular grains of a brilliant colour, mostly very soft, and usually very uniform in quality and in clean condition.

(*b*) Small-berried wheat, more dull in colour than the foregoing, and less uniform in quality, hardly any samples being quite free from admixture with red or hard white wheat. Frequently the admixture of red grains is so considerable, that the wheat must be called mixed rather than white, and there may be such a preponderance of hard or almost hard grains as to give to the sample the character of a semi-hard rather than of a soft wheat.

(*c*) A large-berried wheat, thick in the middle, pointed at the ends, rarely uniform in colour; some grains as bright as the first variety just mentioned, others more dull and grey, occasionally passing into red, but more frequently mixed with hard grain, or passing into it by imperceptible degrees, the individual grains being often partly soft and

partly hard. In fact, the greater portion of the samples of this description must be described as semi-hard.

(*d*) Wheat, with a peculiar, short, roundish grain, in appearance like pearl barley. It is the wheat known under the names of paighumbree, gilghit, giljit or nikka in the Punjab, and of chunia, munia or rae muneer in Oudh and the North-Western Provinces. It occurs locally in Oudh, the North-Western Provinces, the Punjab and Sind; but it does not possess any great importance, as it does not appear to be very prolific. Although it is mostly semi-hard, or even almost hard, the samples were very favourably reported on.

The sample sent from the Delhi district under the name "gundun safed" (No. 273 in valuation list*) may be accepted as the finest type of wheat grown in India. It is a soft white stout grain, remarkably uniform in quality and in clean condition. The weight is very high, amounting to 65lbs. per bushel. It is equal to the finest wheat grown in South Australia or California, the countries from which of all others the finest qualities of wheat are imported. It has been valued at 48*s*. per quarter of 496 lbs., this being the quotation for best Australian wheat at the time, and it has been declared equal in quality to the finest sample of wheat shown in the late Paris Exhibition. Nor is this an exceptional sample. Wheat of equal value and of equal excellence has been sent from Gya in Behar ("dawudia," No. 150), from Unao in Oudh ("saman," No. 359), from Bulandshahr and Meerut in the North-Western Provinces ("safed," No. 397, "safed," No. 629, and "safed," No. 459), from Dera Ismail Khan in the Punjab (No. 411), as also from Hoshungabad in the Central Provinces ("white pissi," No. 575). These places indicate the limits of the area within which the finest wheat is cultivated, and within which may be found a considerable number of samples ranging in value from 46*s*. to 48*s*., which are but little inferior to the eight samples selected as types of the best wheat, and which are mostly described by the valuer as being similar to Australian or Californian wheat. Not only most of the 45 samples ranging in value from 46*s*. to 48*s*., but also many of the 48 samples valued from 44*s*. to 46*s*., consist substantially of wheat of the same quality; all more or less like Australian or Californian, and only slightly depreciated in value by weevil, by slight admixture with red or hard grains, with barley, gram or oilseeds, or impurities of other description. The local names vary from province to province, but no corresponding difference appears in the grain. The samples belonging to this class under the various names of pissi in the Central Provinces; shori in Sind; zurd kanak in the Punjab; daudia, safeda, setwa, muria, mundia or gajar in the North-Western Provinces and Oudh; dawudia in Behar—are almost indistinguishable in appearance, and all of equal excellence, though, under the same names, many other samples may be found which are perfectly different in appearance, and often really inferior in quality.

The varieties previously described as the small-berried and the large-berried respectively constitute the greater portion of the wheats of grades Nos. 1 and 2, and of those of lower quality. But in the comparatively rare instances in which they are characterised by

* Pages 270 *et seq*. of these Selections.

considerable uniformity and softness of grain, they range as high in value as the samples resembling the Australian wheat, whilst the value of even this latter variety may be reduced by the admixture of impurities to the lowest level observed in any of the other varieties.

It has been already explained that both the small-berried and the large-berried variety of soft white wheat are usually of less uniform appearance than the Australian-like wheat, and that they frequently contain a considerable admixture of red and of hard white wheat, so as to render it often difficult to decide whether a given sample should be classed as a red or a white, a hard or a soft wheat. This seems to afford an explanation why the same name so often serves to designate varieties of gain which appear to be very different from each other. Thus under the name of "jamali" a number of small-berried varieties were sent from Bengal, some of which were soft and white, others perfectly hard, white or red, others again a beautiful soft red, while most were rather mixed in character. In the same way the large-berried soft variety occurs frequently under names like burghona, anokha, kathia, jalalia, and bansi, usually applied to hard white wheats, or even under the name of desi, usually applied to red wheats ; and in fact it is rarely free from a considerable admixture of hard grains, even if the individual grain does not, as is often the case with the bansi variety in the Central Provinces, possess a mixed character, partly soft, partly hard.

Every defect in the way of colour, uniformity and softness of the grain diminishes in a corresponding manner the value of the sample ; but the quality is even more seriously deteriorated by the admixture of foreign substances, especially of barley, gram, linseed and rapeseed, or other grains. Other impurities, such as lumps of earth and clay, and chaff, likewise occur, and often reduce the value of the wheat considerably. In many of the samples mere screening would suffice to separate the fine grain from the impurities, and to improve the value by as much as 5*s*. per quarter. For instance, a sample from the Etawah district ("mundia" No. 498) has been valued at only 37*s*. on account of the considerable admixture of barley and gram and impure condition generally ; but the valuer reported that by cleaning the value could be raised to 42*s*. It may be noticed that the Sind samples especially suffer from the presence of barley, and that the wheat, which is often of the finest quality, is thereby rendered often quite unsaleable, as being in its actual condition quite unfit for milling.

The following list of some of the finest samples of soft white wheat will serve to give some idea of the names under which some of the finest samples were sent, as also of the places in which they were produced :—

District.	No.	Name.	Weight per bushel.	Price per quarter.		Remarks.
Lower Provinces of Bengal.						
				s.	*d.*	
Chumparun ...	157	Dawudia ...	63	47	0	Small-berried.
Gya ...	150	„ ...	62½	48	0	Like Californian.
Patna ...	141	Maghie ...	64½	45	6	
Shahabad ...	144	Dudhia ...	62	47	0	Like Californian.

District.	No.	Name.	Weight per bushel.	Price per quarter.		Remarks.
				s.	*d.*	
North-Western Provinces and Oudh.						
Azamgarh ...	713	Daudi ...	61	46	0	
Benares ...	703	Daudia ...	...	46	0	
Basti ...	715	Gangajali ...	...	45	0	
Banda ...	704	Pisi gangajali..	...	47	0	
Cawnpore ...	642	Muria ...	...	48	0	
„ ...	621	Anokha ...	...	47	0	
„ ...	637	Desi ...	...	46	0	Large berry.
„ ...	514	Mudia ...	...	44	6	Fine drop wheat, probably 64lbs.
Fatehpur ...	639	Pisi awwal ...	...	46	0	
„ ...	670	Muria ...	...	45	0	
Partabghar ...	466	Mundwa ...	62½	47	0	Like Californian.
„ ...	630	Setwa ...	60	46	6	
„ ...	614	Mundia ...	...	46	0	
Bahraich ...	489	Daudi ...	61	46	6	Like Californian.
„ ...	488	Sambodhwa ...	...	46	0	
„ ...	702	Sandhua ...	...	46	0	
Gonda ...	767	Daudi ...	...	45	6	
Unao ...	359	Saman ...	...	48	0	
„ ...	361	Marua ...	...	46	0	Like Californian.
„ ...	633	„ ...	...	46	0	„
„ ...	672	Safeda ...	...	45	0	
Kheri ...	386	Sitia ...	60½	45	0	Like Danzic, but dirty.
Sitapur ...	350	Mandia ...	61	46	0	Like Californian.
„ ...	665	Muria ...	...	46	0	
Lalitpur ...	636	Pisi duem ...	...	45	0	
Etah ...	430	Mundia ...	62	47	0	Like Australian.
„ ...	632	Sambharia ...	...	46	0	Like Californian.
„ ...	671	Ratta ...	...	46	0	„
Muttra ...	631	Safeda ...	...	46	6	„
Mainpuri ...	635	Sambharia ...	...	47	0	„
„ ...	634	.....	...	46	6	„
Bulandshahr ...	459	Safed ...	63	48	0	Like Australian.
„ ...	463	Gajar ...	63½	47	0	Like Californian.
„ ...	640	Safed ...	...	46	6	„
„ ...	465	Mendha ...	62½	46	0	„
„ ...	638	Gajar ...	...	46	0	
„ ...	626	Rutta ...	62	45	6	
„ ...	462	Ruta ...	63	45	0	
„ ...	657	Munia ...	...	45	0	Like pearl barley.
Dehra Dun ...	681	Mihirta ...	...	45	0	
Meerut ...	397	Safed ...	62	48	0	Like Californian.

District.	No.	Name.	Weight per bushel.	Price per quarter.		Remarks.
				s.	*d.*	
North-Western Provinces and Oudh—contd.						
Meerut ...	629	Safed ...	...	48	0	Like Californian.
„ ...	403	Monda ...	62	47	0	„
„ ...	641	Muria ...	...	45	6	
Muzaffarnagar..	699	Safeda ...	...	46	0	
Saharanpur ...	310	Monda ...	62½	46	6	
„ ...	663	Muria ...	...	45	0	
Bareilly ...	625	Sambharia ...	...	46	0	
„ ...	677	Pisia ...	60	46	0	
„ ...	692	Khatia ...	...	45	0	
Budaon ...	697	Bhambria ...	...	46	6	
„ ...	698	Muria ...	61	46	6	
„ ...	617	Ratua ...	61	46	0	
„ ...	656	Rai munea ...	...	45	0	Like pearl barley.
Moradabad ...	714	Muria awwal	62	47	0	„ „
„ ...	613	Mundia ...	...	46	0	Small berry.
„ ...	728	Mandwa kada	...	46	0	
„ ...	727	„	...	45	6	
„ ...	726	Muria safed ...	...	45	0	
Punjab.						
Delhi ...	273	Gundun safed	65	48	0	Like Australian.
Sirsa ...	292	.....	61	45	0	
Dera Ismail Khan	411	.....	63	48	0	Like best Californian.
Central Provinces.						
Baitul ...	181	Pissi ...	63	46	0	Like Californian.
Hoshungabad...	575	Pissi, white ...	62	48	0	Like Australian.
„ ...	579	Sohareea ...	...	48	0	„
Mandla ...	171	Pissi sukrawali	60½	46	6	Like Californian.
Saugor ...	165	Pissi ...	62½	46	0	Long-berried.
Seoni ...	189	Mundi ...	64	47	0	Like Californian.
„ ...	188	Pissi ...	59½	45	6	

It will be seen that the majority of the finest specimens, ranging from 45*s.* to 48*s.* per quarter, come from the North-Western Provinces and Oudh. The Central Provinces come next, and there are likewise some specimens from Behar and from the Punjab. No samples equal to the foregoing appear from Bengal proper, although soft white wheat of a tolerably good quality, mostly of the small-berried kind, is grown as low down as the Hooghly district; and a sample from Beerbhoom was fully equal to grade No. 1. As regards the Punjab again, the best samples all come either from the Delhi and Hissar divisions immediately adjoining the North-Western Provinces, or else from the trans-Indus districts, in which the wheat resembles the fine variety cultivated in Upper Sind.

But from the Punjab proper, between the Indus and the Sutlej, no perfect samples of pure soft white were available for report, even the best being rather semi-hard than soft, and the grain less uniform than in the samples included in the foregoing list. Nevertheless, it would not be fair to conclude on this account alone that the cultivation of wheat is conducted less carefully and skilfully in the Punjab than in the North-Western Provinces, because the fragmentary nature of the Punjab collection already commented on, and especially the highly weevilled condition in which most of the samples arrived, make it impossible to accept the Punjab series of valuations as a fair representation of the cultivation of wheat in that province. It must be also remarked that the softest, that is, the finest specimens, are those most exposed to destruction by weevil; and it is likely that, but for their weevilled condition, some of the samples from the parts of the Punjab referred to would have been as favourably reported on as the finest samples from the North-Western Provinces. The same applies to Sind, from which a number of samples were sent equal to the finest grown in India; but their weevilled condition prevented their being valued at anything like the prices assigned to the best samples. The districts under Bombay sent no samples which could be compared with the finest wheat of the Central Provinces; but a few samples were sent from Broach and from Khandesh which come up to grade No. 1.

The weights per bushel given in the above list of samples are very high, notwithstanding that some of the samples were touched by the weevil. None weigh less than 60 lbs. per bushel, whilst in some cases the weight goes up to as high as from 63 to 65 lbs.

Observations on the samples of hard white wheat.

8. *Hard white wheat.*—There is much less variety among the different samples of hard white wheat than among those of soft white wheat already noticed. A great number of samples resemble in appearance the large-berried soft or semi-hard wheat already described, only that they are completely hard and translucent. Others, with the same difference, resemble the small-berried soft or semi-hard variety. There is in addition a considerable number of samples with a long thin ricey grain, resembling some of the inferior varieties of hard red wheat. These latter samples, frequently known under the name of khattya, kathe, kuthya, are really an inferior grain in every respect, and the samples are rarely in a good condition, most of them containing chaff, dirt and foreign substances in considerable quantity. But among the large-berried samples there are many of a very high quality, with clear uniform grains, in good condition and free from impurities. In fact, many of these samples are equal, if not superior to the best hard St. Petersburg or Kubanka, which is usually considered as the type of wheats of this kind. The highest prices realised by the hard white wheats are, however, much below those ranging in the London market for the soft wheats; and, as already remarked, the Mediterranean, and especially Italy, seems to afford the best market for wheat of this description, which is in demand there for the manufacture of macaroni, and frequently fetches prices as much as 5*s.* per quarter in excess of the quotations of the London market.

No classification in any way resembling that of the soft white exists for the hard white wheat; but in order to obtain a view similar to that given for the samples of the former variety, the hard white wheats have been arranged in groups corresponding to the same ranges of price as those of the different classes of the soft white. The following table shows the result of this classification :—

Name of Province.	Number of samples of hard white wheat of a value per quarter equal to that of the undermentioned classes of soft white wheat.				
	Class I, 43*s.* 6*d.* to 47*s.* 6*d.*	Class II, 39*s.* 6*d.* to 41*s.*	Ordinary quality, 37*s.* to 39*s.*	Inferior quality, below 37*s.*	Total.
Bengal ...	3	4	5	...	12
North-Western Provinces and Oudh.	5	23	8	1	37
Ajmere and Merwara ...	...	1	...	...	1
Punjab ...	...	2	...	1	3
Sind ...	...	...	8	7	15
Bombay ..	3	29	27	1	60
Central Provinces ...	...	5	3	...	8
Berar ...	2	19	10	...	31
Madras ...	...	...	...	...	...
Mysore ...	...	...	...	...	...
Burma ...	...	...	...	...	...
Total ...	13	83	61	10	167

It will be seen that a considerable proportion of the samples is supplied by Bombay and Berar, from which hardly any samples of the soft wheat were sent. These two provinces supply by themselves more than one-half of the samples of hard white wheat. The number of samples (37) sent from the North-Western Provinces and Oudh is large in itself; but it appears small when compared with the number of soft white samples from the same parts, which was almost seven times larger. The following list enumerates some of the best samples of the wheat now under consideration :—

District.	No.	Name.	Weight per bushel.	Value per quarter.	Remarks.
		Lower Provinces of Bengal.			
				s. *d.*	
Moorshedabad	109	Jamali ...	62½	41 6	Short-berried.
Monghyr ...	57	Bogra ...	62	41 0	Long-berried, flinty.
Maldah ...	77	Gangajali ...	63½	42 0	Very fine, long-berried.
Tirhoot ...	145	Jamalkhani ...	64	41 6	Small-berried.

District.	No.	Name.	Weight per bushel.	Value per quarter.	Remarks.
		North-Western Provinces and Oudh.			
				s. d.	
Gonda ...	394	Daudi ...	63	41 0	Mostly hard.
Barabanki ...	367	Murua ...	62	41 0	Mixed, hard.
Lucknow ...	475	Tamla ...	64½	42 6	
Unao ...	650	Samanbargehuna ...		41 0	Long-berried.
Etah ...	435	Bhidia ...	61	40 6	Long-berried, like Kubanka.
Mainpuri ...	379	Anokha ...	60½	42 0	Long-berried.
„ ...	656	„ ...	...	40 6	„
Aligarh ...	643	Kathia ...	58	41 0	„
Bulandshahr ...	651	Barha ...	...	42 0	„
„ ...	461	„ ...	...	46 0	Large-berried.
Meerut ...	402	„ ...	61	41 0	Long-berried.
„ ...	654	„ ...	...	40 6	„
Budaon ...	655	Ratua ...	...	40 6	„
Shahjahanpur	481	Sambhari ...	60	40 6	
		Punjab.			
Sirsa ...	291	Brown wheat	60½	41 0	Small-berried.
		Bombay.			
Bhaunagar ...	25	Hasia ...	60½	40 6	Long-berried.
Khandesh ...	580	Kalee kusal ...	61	42 6	„
„ ...	605	Bansi ...	62½	42 6	Very fine.
Nasik ...	999	Yellow bansi	57	40 0	Finest of all, but weevilled.
Panch Mehals	1011	Daudkhani ...	62	42 0	Large-berried.
„ ...	1013	Kathee malvi	61	40 6	
Dharwar ...	581	.....	58	40 6	
Poona ...	965	Bakshi gahu	62	41 0	Large-berried, finest kind grown.
Satara ...	994	Buxi ...	60	40 6	Very fine.
		Central Provinces.			
Saugor ...	164	Hansia ...	62½	40 6	Long-berried.

District.	No.	Name.	Weight per bushel.	Value per quarter.	Remarks.
		Berar.		*s.* *d.*	
Nagpur ...	197	Botka ...	61	40 6	Long, thin.
Oomraoti ...	879	Bansi ...	61	41 6	Long-berried.
Ellichpur ...	923	„ ...	60½	41 0	„
„ ...	918	„ ...	60	40 6	„
Akola ...	894	„ ...	61	41 6	„
„ ...	891	„ ...	60	41 0	„
Buldana ...	908	„ ...	61	41 0	
„ ...	914	„ ...	60	41 0	
„ ...	912	„ ...	61	40 6	

The finest of these samples is (No. 605) "bansi," from Khandesh, valued at 42*s.* 6*d.*, though even this sample would have been probably surpassed by a sample of "yellow banshi" (No. 999) sent from Nasik, had not the latter arrived very much damaged by weevil. All parts of the Bombay Presidency south of the Nerbudda supply fine samples under the names of banshi, bansi, bukshi, buxi, jalalia, and others. But some of the samples from the North-Western Provinces and Oudh sent under the names of barha, tamla, anokha and others are equally good. One of the best samples, "gangajali" (No. 77), valued at 42*s.*, comes from the Maldah district in Lower Bengal; and altogether the cultivation of hard white wheats, if restricted to a smaller area than that of the soft varieties, results in the production of many samples equal to the finest grown in any country, which sent to a suitable market would be likely to realise prices almost as high as those obtainable for the best descriptions of soft white wheat. It may likewise be noted that the hard wheat appears to be, on the whole, less liable to suffer from weevil than the soft variety. The weights per bushel are almost as high as in the soft white; all but a few are above 60lbs. per bushel, some as high as 64½lbs. Of the few samples below 60lbs., most are so much weevilled, that the loss of weight is accounted for.

Observations on the samples of soft red wheat.

9. *Soft red wheat.*—The condition of most of the samples of soft red wheat affords evidence that its cultivation is conducted with much less care than that of the fine white varieties. They are, as a rule, much mixed with barley, gram or oilseeds and foreign substances of all descriptions, and the grain is rarely so uniform in its quality as in the good white samples. The striking uniformity in the native names for the red wheat is in itself a proof of the smaller estimation in which it is held by the native agriculturist. In the greater number of districts, in which half-a-dozen or more different varieties of white wheat will be cultivated under as many different names, the red wheat will be known only under

the generic denomination of "lal" or "surkh," indicating that the process of selection of seed and cultivation of special varieties has been applied to red wheat in a much smaller degree than to the white wheat. The red wheat is, however, deserving of more attention than it now receives; for the soft red varieties are exceedingly suitable for the English market, and very readily saleable. The following table shows the number of samples and their range of prices for each province of India, the classes being those adopted for the soft white wheat, as there is no corresponding classification for the red variety:—

Name of Province.	Number of samples of soft red wheat of a value per quarter equal to that of the undermentioned classes of soft white wheat.				
	Class I, 41*s.* 6*d.* to 43*s.* 6*d.* per quarter of 496 lbs.	Cass II, 39*s.* 6*d.* to 41*s.*	Ordinary quality, 37*s.* to 39*s.*	Inferior quality, below 37*s.*	Total.
Bengal ...	3	11	6	1	21
North-Western Provinces and Oudh.	2	23	38	8	71
Ajmere and Merwara.	2	1	...	...	3
Punjab ...	2	7	11	10	30
Sind ...	...	1	...	1	2
Bombay ...	...	8	5	...	13
Central Provinces ...	1	2	10	...	13
Berar ...	...	3	4	...	7
Madras ...	...	...	...	...	...
Mysore ...	...	...	...	...	...
Burma ...	...	...	...	...	...
Total ...	10	56	74	21	161

As may be seen from the foregoing table, the provinces in which the soft red wheat is chiefly grown are the same as those in which the soft white is cultivated; but the limit of cultivation of the former, as previously remarked, extends rather further to the south than that of the soft white variety. The following is the list of the finest samples of soft red wheat obtained:—

District.	No.	Name.	Weight per bushel.	Price per quarter.	Remarks.
		Lower Provinces of Bengal.			
				s. *d.*	
Beerbhoom ...	89	Jamali ...	61½	41 0	
Burdwan ...	99	Desi ...	61	41 0	Small-berried.

District.	No.	Name.	Weight per bushel.	Price per quarter.	Remarks.
				s. d.	
Lower Provinces of Bengal—contd.					
Bhagulpore ...	66	Jamali ...	62½	41 0	Small-berried.
Hazaribagh ...	162	Gour ...	63	41 6	Small-berried, yellowish.
Lohardugga ...	158	Jogra ...	63½	42 0	Stout.
Gya ...	149	Lall ...	64	41 6	Stout, short-berried.
Tirhoot ...	127	Sarhal ...	62	40 6	Fine, clean, semi-hard.
North-Western Provinces.					
Azamgarh ...	148	Hurrah ...	63½	41 0	Small-berried, semi-hard.
Allahabad ...	777	Raksa ...	...	41 0	
Cawnpore ...	789	Pisia ...	...	41 0	
Jalaun ...	473	Pisia red ...	61½	41 6	Large-berried.
Muttra ...	790	Lal ...	...	40 6	
Bulandshahr ...	464	Gehun lal ...	62½	42 0	
Meerut ...	398	Surkh ...	61½	41 0	Long-berried.
Ajmere and Merwara.					
	588	Baja maigee	61	41 6	
	592	Kharcha baja	64½	42 6	
	590	„	62	41 0	
Punjab.					
Gurgaon ...	259	.....	64	41 6	
Rohtak ...	427	Red wheat ...	62	41 0	
Jhelum ...	272	Lal ...	61½	41 0	
Shahpur ...	410	Rati ...	61	41 0	Large-berried, mixed with barley.
Dera Ismail Khan	413	Rutti kanak ...	60½	41 6	Long-berried.

District.	No.	Name.	Weight per bushel.	Price per quarter.		Remarks.
				s.	d.	
Bombay Presidency.						
Bhaunagar ...	15	Vajia ...	58	40	6	Semi-hard.
	22	Patalia ...	58	40	6	„
	9	„ ...	59½	40	6	„
Central Provinces.						
Nimar ...	194	Dhunya ...	...	40	6	Fine specimen.
Bilaspur ...	567	Khathia ...	60	41	6	Small-berried.
	566	Red pissi ...	63	41	0	
Berar.						
Bassim ...	906	Casdee ...	61	41	0	

All these samples represent wheat which is very suitable for the English market. The finest sample is one from Ajmere, "kharcha baja" (No. 592); but, as will be seen from the list, there are numerous samples almost equal to it from Bengal, the North-Western Provinces, the Punjab and the Central Provinces. The samples from the provinces just named are, as a rule, comparatively light in colour, and quite as soft as the softest white wheat. But from Bombay a good many samples of a large-berried wheat were sent which deserve rather the name of brown than of red wheat, on account of the darkness of their colour. They are also much harder than the usual soft wheat—in fact almost hard. Still some of the samples grown in the State of Bhaunagar are favourably reported on, with values up to 40*s.* 6*d.* per quarter. It may be likewise remarked that in the Punjab, from which several of the best samples were obtained, there appears to be grown in many districts a very degenerate kind of red wheat, in which a large proportion of the grains are so thin and shrivelled, that they resemble rather grass-seeds than the berries of a cultivated grain.

The prevalence of inferior varieties in the Punjab may be gathered from the fact that, out of 30 samples of soft red wheat, 10 are classed as inferior, being in value below 37*s.* the quarter; whereas out of 131 samples sent from the other parts of India only 11 are inferior. The weights per bushel given in the list are as high as in the preceding group, rising to 64½ lbs.; and only in three instances is the weight below 60lbs.

Observations on the samples of hard red wheat.

10. *Hard red wheat.*—The following table shows the number of samples and their range of prices:—

Name of Province.	Number of samples of hard red wheat.		
	Ordinary quality, 37*s.* to 39*s.*	Inferior quality, below 37*s.*	Total.
Bengal ...	2	6	8
North-Western Provinces and Oudh.	4	11	15
Punjab ...	...	4	4
Sind ...	...	...	...
Bombay ...	31	29	60
Central Provinces ...	11	1	12
Berar ...	13	3	16
Madras ...	5	13	18
Mysore ...	1	5	6
Burma ...	...	2	2
Total ...	68	74	142

Most of these samples come from the Deccan and Southern India, and a very large proportion are inferior in quality, very thin, hard and very dark. Wheat of this description is not in good demand in the London market.

India Office;
The 29th March 1879.

J. FORBES WATSON.

Valuation of the samples of wheat forwarded in accordance with the orders of the Government of India of 14th March 1877.

The values given are based upon the quotations ruling in the London market in the beginning of February 1879.

Key to letters showing colour and hardness—A, soft white; B, hard white; C, soft red; D, hard red.

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		BENGAL.						
		Presidency Division.						
		Nuddea District.					s. d.	
124	2	Krishnagar ...	D	Jamali ...	Weevilled ...	60	38 0	Good, mixed, hard red; some barley.
123	1	.....	—	Dhudia ...	Destroyed by weevil.			
		Burdwan Division.						
		Beerbhoom District.						
90	2	.....	A	Dudhia ...	.....	62	43 0	Fine, soft, white.
89	1	.....	C	Jamali ...	Weevilled ...	61½	41 0	Fine, small, soft berried, red.
93	5	.....	,,	Kheri ...	Ditto	60½	40 0	Good, soft, red, small-berried, little dirty.
91	3	.....	—	Gangajali ...	Destroyed by weevil.			
92	4	.....	—	Desi ...				
		Burdwan District.						
99	11	.....	A C	Kheri jamali ...	Weevilled	57½	31 6	Inferior, dingy reddish, mixed with barley, earth and seeds; would require screening.
95	7	Bood-bood ...	C	Desi ...	.....	61	41 0	Fine, soft, small-berried, red.
94	6	.....	—	Jamali ...	Destroyed by weevil.			
96	8	.....	—	Dudhia jamali ...				
97	9	.....	—	Jamali ...				
98	10	.....	—	Gangajali ...	Lost.			
		Hooghly District.						
100	12	Hooghly ...	A	Dhudia ...	Very much weevilled...	—	39 0	Good, white, about No. 2.
101	13	Ditto ...	C	Jamali ...	Weevilled ...	56	38 0	Good, soft, small-berried, red; some barley.
		Orissa Division.						
		Balasore District.						
103	2	.....	D	Desi No. 2 ...	.....	61	36 6	Dingy, clean, hard, red.
102	1	.....	—	Desi No. 1 ...	Destroyed by weevil.			
104	3	.....	—	Gobra ...				
		Rajshahye Division.						
		Moorshedabad District.						
107	3	Moorshedabad ...	A	Jamali ...	.....	—	34 6	Largely mixed with grain; wheat good.
109	5	Dewanserai ...	B	Ditto ...	Weevilled ...	62½	41 6	Fine, hard, short-berried, nearly white.

118	14	Sooty ...	„	Gangajali ...	.....	61	40	0	Fine, hard, long-berried, flinty white.
117	13	Ditto ...	„	Jamati ...	.....	59	38	6	Good, hard, long-berried, flinty white.
105	1	Moorshedabad ...	„	Gangajali ...	Weevilled ...	59	38	0	Good, hard, white, a little mixed with earth.
115	11	Mirzapur ...	C	Ditto ...	.....	60½	38	6	Good, red, mixed with barley.
108	4	Dowlatabad ...	„	Kheri ...	.....	—	32	0	Inferior, small-berried, red, mixed with gram.
116	12	Mirzapur ...	D	Ditto ...	.....	58¾	34	6	Common, red, mixed with barley.
106	2	.....	—	Ditto ...	Lost.				
110	6	.....	—	Gangajali ...					
111	7	.....	—	Kheri ...					
112	8	.....	—	Jamali ...	Destroyed by weevil.				
113	9	.....	—	Ditto ...					
114	10	.....	—	Ditto ...					
119	15	.....	—	Kheri ...					
		Rajshahye District.							
120	16	Jellinghee ...	D	Jamali ...	.....	59	36	6	Hard, small, thin-berried, red.
121	17	.....	—	Gangajali ...	Destroyed by weevil.				
122	18	.....	—	Kheri ...					
		BHAGULPORE DIVISION.							
		Bhagulpore District.							
60	7	.....	A	Jamali ...	.....	62½	43	0	Fine, white, small-berried, rather hard, better than No. 1.
						61	43	0	Good, white, rather better than No. 1 club.
64	11	.....	„	Ditto ...	Weevilled ...	61	42	6	Fine, long-berried, white, semi-hard.
68	15	.....	„	Burghona ...	.....	61	42	0	Good, small-berried, white, semi-hard.
59	6	.....	„	Jamali ...	.....	60	40	0	Fine, white, mixed with gram.
65	2	Banka ...	„	Dudhia ...	Little weevilled ...	60½	39	0	Good, small-berried, hard white.
67	14	Bhagulpore ...	B	Jamali ...	Ditto ...	62½	41	0	Fine, small-berried, red.
66	13	Kishengunge ...	C	Jamali ...	.....				
58	5	Lakhanpur ...	—	Sona Ticker ...	Destroyed by weevil.				
61	8	Soopole ...	—	Dudhia ...	Lost.				
62	9	.....	—	Jamalia ...	Destroyed by weevil.				
63	10	Madipura ...	—	Dudhia ...					
69	16	.....	—	Ditto ...	Lost.				
70	17	.....	—	Jamali ...	Destroyed by weevil.				
		Monghyr District.							
57	4	Monghyr ...	B	Bogra ...	.....	62	41	0	Fine, hard, long-berried, white, flinty.
56	3	Ditto ...	„	Jamali ...	.....	63	40	0	Good, clean, hard, small-berried, white.
54	1	Ditto ...	—	Dudhia, No. 1 ...	Destroyed by weevil.				
55	2	Ditto ...	—	Ditto, No. 2 ...					
		Maldah District.				59	41	0	Good, thin, long, white, semi-hard.
71	18	.....	A	Jamali ...	.....	63½	42	0	Very fine, long-berried, clean, hard, white.
77	24	Gomastipore ...	B	Gangajali ...	.....	62½	40	0	Fine, hard, small-berried, white.
72	19	.....	„	Jamali ...	Little weevilled ...	—	37	0	Common, hard, white, mixed with earth.
86	33	Nahalgunge ...	„	Kheri ...	.....	61	40	0	Good, small-berried, red.
81	28	Nawalgunge ...	C	Ditto ...	.....	59	39	6	Good, small-berried, soft.
76	23	.....	„	Jamali ...	Weevilled ...	62	35	0	Rough, hard, reddish, mixed with earth; wheat good, requires cleaning.
87	34	Gomastipore ...	D	Gangajali ...	.....				
73	20	Debipore ...	—	Ditto ...	Destroyed by weevil.				
74	21	.....	—	Kheri ...					

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample. Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Maldah District—contd.						
75	22	.....	—	Mukri ...			s. d.	
78	25	Kharba ...	—	Gangajali ...				
79	26	Gomastipore ...	—	Kheri ...				
80	27	Shibaganj ...	—	Ditto ...	Destroyed by weevil.			
82	29	Debipore ...	—	Ditto ...				
83	30	Nawabganj ...	—	Gangajali ...				
84	31	Gazole ...	—	Kheri ...				
85	32	Ditto ...	—	Gangajali ...				
88	35	English Bazaar ...	—	Ditto ...	Lost.			
		Purneah District.						
297	A	.....	—	Dudhi ...				
298	B	.....	—	Gangajali ...	Destroyed by weevil.			
299	C	.....	—	Jamali ...				
		Sonthal Pergunnahs.						
210	—	Rajmahal ...	—	Gangajali ...				
211	—	Ditto ...	—	Jamali ...				
212	—	Deoghur ...	—	Gahu ...	Destroyed by weevil.			
213	—	Doomka ...	—	Jamali ...				
		CHOTA NAGPORE DIVISION.						
		Hazaribagh District.						
162	5	.....	C	Gour ...	.....	63	41 6	Fine, small-berried, red yellowish, clean.
		Lohardugga District.						
160	3	.....	A	Dudhia ...	.....	62	44 0	Fine, soft, white, few reddish grains.
158	1	.....	C	Jogra ...	.....	63½	42 0	Fine, soft, clean, stout, red.
159	2	.....	—	Chumpapuri ...	Destroyed by weevil.			
		Manbhoom District.						
161	4	.....	—	Choonia ...	Destroyed by weevil.			
		Singbhoom District.						
163	6	.....	C	Lalka ...	.....	61	40 0	Fine, small-berried, clean, red.
		PATNA DIVISION.						
		Chumparun District.						
157	33	.....	A	Dawudio ...	.....	63	47 0	Fine, soft, small-berried, white.
156	32	.....	"	Jamalkhani ...	.....	61	40 6	Good white, about No. 2; some linseed.
154	30	.....	A C	Hada ...	Weevilled ...	61	40 6	Fine, mixed, but few linseed grains, rather better than No. 2.
155	31	.....	C	Lalka ...	.....	62	38 0	Fine, small-berried, soft, red, mixed with linseed and other seeds; requires cleaning.

		Gya District.							
160	26	.....	A	Dawoodie	...	.....	62½	48 0	Fine, white, soft, some rice, mixed, like Californian.
149	25	.....	C	Lal	...	.....	64	41 6	Fine, stout, soft, short-berried, red, little linseed.
		Patna District.							
141	17	.....	A	Maghie	...	.....	64½	45 6	Fine, soft, white, mixed with some reddish white.
140	16	.....	„	Ditto	...	.....	63	41 6	Good, mixed, nearly white, about No. 1.
139	15	.....	„	Jamali	...	Weevilled ...	62½	40 0	Good stuff, small-berried, white, mixed with barley and gram.
136	12	.....	C	Maghie	...	.....	61	39 0	Good, soft, smallb-erried, and red.
135	11	.....	„	Lalee	...	Little weevilled ...	62½	37 6	Good, red, dirty, semi-hard, mixed with gram and linseed.
137	13	.....	—	Doodhia	...	Lost.			
138	14	.....	—	Maghie	...	Destroyed by weevil.			
		Sarun District.							
152	28	.....	A	Doodhia	...	Little weevilled ...	59½	38 6	Wheat good, a few gram.
153	29	.....	A C	Jamalia	...	.....	61	37 6	Good, soft, mixed, some gram.
151	27	.....	C	Lalee	...	Little weevilled ...	63	40 0	Good, short-berried, semi-hard, red.
		Shahabad District.							
144	20	.....	A	Doodhia	...	Weevilled ...	62	47 0	Fine, soft, white, like Californian.
142	18	.....	„	Hurha	...	.....	64	41 6	Fine, stout, soft, some gram.
143	19	.....	C	Jamalia	...	.....	62	38 6	Fine, soft, red, some gram, few damaged grains.
		Tirhoot District.							
146	22	Mozaffarpur ...	A	Lal Desi	...	.....	63	44 6	Fine, clean, small-berried, mixed, white.
147	23	Ditto ...	A C	Doodhia	...	.....	64	43 0	Fine, clean, semi-hard, red and white.
132	8	Durbhunga ...	A	Haraha	...	Weevilled ...	64½	41 6	Very clean, a few grains of linseed, equal to No. 1 club.
129	5	Saraisa ...	A C	Sarhoa	...	.....	—	38 6	Ordinary, mixed, scarcely No. 2, mixed with gram.
128	4	Durbhunga ...	„	Hada	...	.....	61	38 0	Good, mixed with barley, equal No. 2.
145	21	Mozaffarpur ...	B	Jamalkhani	...	A little weevilled ...	64	41 6	Fine, regular, small-berried, hard, white.
126	2	Ditto ...	„	Ditto	...	.....	61	39 0	Good, hard, flinty, white.
148	24	Ditto ...	C	Hurrah	...	.....	63½	41 0	Fine, clean, small-berried, semi-hard, red.
127	3	Ditto ...	C D	Sarhab	...	.....	62	40 6	Fine, clean, semi-hard, red.
125	1	Ditto ...	„	Jamalkhani	...	.....	62½	40 0	Fine, semi-hard, red.
133	9	.....	D	Hadhee	...	.....	—	37 6	Stout, hard, dingy red.
130	6	Saraisa ...	„	Ditto	...	.....	—	35 0	Common, hard, small-berried, red, mixed with barley.
134	10	.....	„	Ditto	...	.....	—	35 6	Small-berried, hard, red, mixed with barley.
131	7	Seripeer ...	—	Herraha	...	Lost.			
		NORTH-WEST PROVINCES AND OUDE.							
		BENARES DIVISION.							
		Azimgarh District.							
713	—	.....	A	Daudi	...	.....	61	46 0	Fine, white, superior No. 1.
313	—	.....	„	Ditto	...	Weevilled ...	64	43 0	Fine, white, small-berried, clean.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
							s. *d.*	
		Azimgarh District—contd.						
791	—	.....	C	Lalia ...	.....	—	40 0	Good, red, soft.
314	—	.....	—	Ditto ...	Destroyed by weevil.			
		Benares District.						
703	—	.....	A	Daudia ...	.....	—	46 0	Fine, white, coloury, soft.
747	—	.....	,,	Desi ...	.....	—	41 6	White, about No. 2.
781	—	.....	A C	Lal ...	Much weevilled ...	—	40 6	Small-berried, mixed white and red, soft.
822	—	.....	C	Mungeri ...	.....	—	39 0	Good, red.
525	—	.....	,,	Gehun Lal ...	Weevilled ...	60	38 0	Soft, good, large-berried, chiefly red, mixed with oil-seeds.
526	—	.....	,,	Gehun Desi ...	Ditto ...	56½	37 0	Small-berried, little shrivelled, weevil, and linseed.
523	—	.....	—	Dandi ...	Lost.			
524	—	.....	—	Mungen ...	Destroyed by weevil.			
		Basti District.						
715	—	.....	A	Gangajali ...	Weevilled ...	—	45 0	Fine, white, superior No. 1.
764	—	.....	,,	Daudi ...	.....	—	43 0	White, about No. 1.
487	—	.....	C	Lalia ...	Much weevilled ...	—	40 0	Fine, small-berried, red, soft.
823	—	.....	C A	Ditto ...	.....	—	39 0	Ordinary red, small berry, mixed, white.
776	—	.....	C	Samudhra ...	Much weevilled ...	54	38 0	Good, red, some white.
484	—	.....	—	Gangajali ...	Destroyed by weevil.			
485	—	.....	—	Daudi ...				
486	—	.....	—	Samodhwa ...				
		Ghazipur District.						
679	—	.....	A	Daudi ...	.....	—	43 6	Good, white, about No. 1, but thin.
307	—	.....	,,	Ditto ...	Weevilled ...	56½	40 0	Good, white, soft, good colour, rather dirty.
308	—	.....	C	Lalia ...	Ditto ...	62	39 0	Good, red, but dirty.
810	—	.....	,,	Ditto ...	Much weevilled ...	—	39 0	Good, red, soft.
		Gorakhpur District.						
377	—	.....	C A	Lalia ...	Weevilled ...	62½	40 0	Fine, red, mixed with white, clean.
792	—	.....	C	Ditto ...	.....	—	.....	Good, red.
376	—	.....	—	Daudi ...	Destroyed by weevil.			
		Mirzapur District.						
334	—	.....	A	Daudi ...	Weevilled ...	62	43 0	Fine, small-berried, soft, white.
785	—	.....	C	Lalia bargehuna ...	.....	—	40 0	Good, red, soft.
335	—	.....	,,	Lalia ...	.....	60½	39 0	Good, stout, red, dirty, gram, &c.
336	—	.....	,,	Lalia tisia ...	Weevilled ...	60	38 6	Good, red, somewhat rough.
784	—	.....	D	Ditto ...	Much weevilled ...	—	36 0	Red, long berry, hard.
337	—	.....	—	Lalia bargehuna ...	Destroyed by weevil.			
694	—	.....	—	Daudi ...				
816	—	.....	—	Lal ...				

		Allahabad Division.								
		Allahabad District.								
343	—	.....	A	Daudi	...	Weevilled	...	59	44 6	Fine, small-berried, soft, white.
344	—	.....	A C	Raksa	...	Ditto	...	60	40 0	Fine, mixed with red, like Polish.
777	—	.....	C	Ditto	...	.....		—	41 0	Good, red, soft.
345	—	.....	,,	Bargehuna	...	.....		60	40 0	Good, red, soft, rough, large-berried.
795	—	.....	,,	Pisi	...	.....		—	39 0	Good, red.
347	—	.....	,,	Pissi surkh	...	Weevilled	...	—	38 6	Good, red, thin.
828	—	.....	,,	Bargehuna	...	.....		—	37 0	Long-berried, red, roughish.
827	—	.....	,,	Kathia	...	.....		—	36 0	Inferior, red, dirty, thin.
346	—	.....	—	Murwa	...	} Destroyed by weevil.				
348	—	.....	—	Kathia	...					
		Banda District.								
704	—	.....	A	Pisi gangajali	...	.....		—	47 0	Fine, white, superior No. 1, soft.
529	—	.....	A C	Pisia lal kattria	...	.....		60½	41 0	Rather mixed, large-berried, about No. 2, few gram, and damaged, and grains.
530	—	.....	A	Haveraj gangajali	...	Damaged	...	—	39 0	Rough, white, gram, rather dirty.
531	—	.....	,,	Pisia gangajali	...	.....		—	38 6	Good, white, mixed, gram, rather hard.
832	—	.....	D	Kathia laltumbia	...	Weevilled	...	58	37 0	Red, long berry, hard.
528	—	.....	,,	Ditto	...	Ditto	...	55½	32 0	Very large berried, rough, hard, red, gram.
527	—	.....	,,	Kathia Shuora	...	.....		60	26 0	Large-berried, hard, red, gram, unfit for milling.
740	—	.....	—	Gangajali	...	} Lost.				
750	—	.....	—	Pisi lal kathia	...					
		Cawnpore District.								
642	—	.....	A	Muria	...	Weevilled	...	—	48 0 (without weevil).	Very fine, white, stout, heavy, soft.
621	—	.....	,,	Anokha	...	.....		—	47 0	Fine, white, superior No. 1, soft.
637	—	.....	,,	Desi	...	.....		—	46 0	Fine, white, superior No. 1, large berry.
514	—	.....	,,	Mudia	...	Much weevilled	...	—	44 6	Fine drop wheat, probably weighs 64lbs.
520	—	.....	,,	Tamra	...	Weevilled	...	61	43 6	Small-berried, white, better than No. 1.
664	—	.....	,,	Ditto	...	.....		—	43 6	White, about No. 1.
695	—	.....	,,	Seta	...	Weevilled	...	—	42 0	White, about No. 1.
675	—	.....	,,	Muria	...	.....		—	41 6	Good white, but semi-hard.
513	—	.....	,,	Madnaia	...	Weevilled	...	62	41 0	Hardish white, mixed, some red.
947	1	.....	,,	Dasee Doodhia	...	Ditto	...	58	39 0	Mixed with barley.
948	2	.....	A C	Dasee Goojur	...	Ditto	...	58	38 6	Mixed with barley.
949	3	.....	A	Gunga	...	Ditto	...	55½	37 0	Inferior, mixed with barley.
950	4	.....	,,	Puchan	...	Ditto	...	54½	36 6	Inferior, mixed with peas.
521	—	.....	B	Anokha	...	Much weevilled	...	—	40 0	Hard, large-berried, clean, white.
647	—	.....	,,	Vilniti	...	.....		—	40 0	Long-berried, hard, part soft.
789	—	.....	C	Pisia	...	.....		—	41 0	Fine, red, soft.
522	—	.....	,,	Ditto	...	Much weevilled	...	60½	39 0	Fine, red, large, clean, long-berried.
831	—	.....	D	Kuthia	...	.....		—	35 0	Inferior, red, long berry, hard, rough.
519	—	.....	,,	Ditto	...	.....		58½	32 6	Very inferior, red, mostly hard, flinty, gram.
515	—	.....	—	Seta	...	Destroyed.				
516	—	.....	—	Vilayeti	...	} Destroyed by weevil.				
517	—	.....	—	Manayia	...					
518	—	.....	—	Disi	...					

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness	Name.	Condition.	Weight.	Value.	Remarks.
		Futtehpore District.						
639	—	.....	A	Pisi awwal ...	Much weevilled ...	—	s. d. 46 0 (without weevil).	Fine, white, large berry.
670	—							
669	—	.....	,,	Muria ...	.....	—	45 0	White, superior No. 1, soft.
751	—	.....	,,	Pisia ...	.....	—	43 6	White, about No. 1.
732	—	.....	,,	Sitia ...	.....	—	42 6	White, nearly No. 1.
455	—	.....	,,	Lalia ...	.....	—	42 0	White, fully No. 2.
458	—	.....	A C	Mundwa ...	Weevilled ...	60½	41 6	Fine, white, nearly mixed white and red.
			C	Kathia ...	Mixed with barley ...	57	21 0	Very inferior, red, small, gram, barley, linseed, unfit for milling.
830	—	.....	D	Ditto ...	Weevilled ...	59	37 0	Red, long berry, hard.
453	—	.....	—	Pissia ...	} Destroyed by weevil.			
454	—	.....	—	Ditto ...				
456	—	.....	—	Lalia ...				
457	—	.....	—	Seta or gangajali ...				
		Jounpore District.						
374	—	.....	A	Daudi ...	A few weevils ...	60½	43 0	Fine, small-berried, soft, white.
730	—	.....	,,	Ditto ...	Much weevilled ...	56	43 0	Good, white, some red.
780	—	.....	A C	Lalia ...	.....	—	40 0	Good, red and white, mixed.
375	—	.....	,,	Ditto ...	Weevilled ...	62½	38 6	Good, mixed, fully No. 2, dirty with seeds.
		ROY BARBILY DIVISION. *Pratabgarh District.*						
466	—	.....	A	Mundwa ...	.....	62½	47 0	Fine, clean, round, white, like Californian.
630	—	.....	,,	Setua ...	.....	60	46 6	Fine, white, superior No. 1.
614	—	.....	,,	Mundia ...	Some weevil ...	—	46 0	Fine, white, small berry, good colour, superior No. 1.
469	—	.....	,,	Satwa ...	Much weevil ...	62½	44 0	Fine, soft, white.
742	—	.....	,,	Majua-phul Khaja ...	.....	—	44 0	Fine, white, about No. 1.
468	—	.....	,,	Rakasiva ...	Weevilled ...	61½	42 6	Good, small, white, better than No. 1.
739	—	.....	,,	Roksua ...	.....	—	41 6	White, about No. 2.
467	—	.....	—	Mujwa or Phul Khaja	Destroyed by weevil.			
		Roy Bareilly District.						
685	—	.....	A	Setua ...	.....	—	42 6	White, about No. 1.
615	—	.....	,,	Mundia ...	.....	—	41 0	White, about No. 2.
701	—	.....	A C	Lalia ...	Much weevilled ...	—	37 0	Poor, ordinary, mixed.
331	—	.....	—	Seta ...	} Destroyed by weevil.			
332	—	.....	—	Lalia ...				
333	—	.....	—	Murwa ...				

		Sultanpur District.								
684	—	.....	A	Dina Shahi	...	.....	—	43	6	Fine, white, about No. 1, soft and hard, mixed.
711	—	.....	,,	Samdhara	...	.....	—	43	6	White, about No. 1.
712	—	.....	,,	Daudia	...	.....	—	43	6	Good, white, about No. 1, soft.
721	—	.....	,,	Mundwa	...	.....	—	42	6	Good, white, nearly No. 1.
762	—	.....	,,	Sitwa	...	Weevilled ...	—	40	6	White, about No. 2.
652	—	.....	B	Vilaiti	...	.....	—	41	6	Long-berried, hard.
763	—	.....	D A	Lalia	...	.....	—	38	0	Ordinary red, mixed white.
352	—	.....	—	Daudi	...					
353	—	.....	—	Dipasahi	...					
354	—	.....	—	Samodhawa	...					
355	—	.....	—	Setwa	...	Destroyed by weevil.				
356	—	.....	—	Lalia	...					
357	—	.....	—	Mundwa	...					
358	—	.....	—	Australian wheat	...					
		FYZABAD DIVISION. *Bharaich District.*								
480	—	.....	A	Daudi	...	.....	61	46	6	Fine, round, soft, white, like Californian, rather harder.
488	—	.....	,,	Sambodhwa	...	Weevilled ...	—	46	0	Fine, soft, regular, clean, white.
702	—	.....	,,	Saudhua	...	.....	—	46	0	Fine, white, coloury.
738	—	.....	,,	Mundia	...	.....	59	43	0	Good, white, about No. 1.
722	—	.....	,,	Chastia	...	.....	60	42	0	White, about No. 2.
490	—	.....	,,	Gangajali	...	.....	61	42	0	Good, soft, small-berried, clean, white, like Danzig.
494	—	.....	,,	Mundia	...	Few weevils ...	60	42	0	Small-berried, good, soft, white, better than No. 1.
773	—	.....	,,	Raksia	...	Weevilled ...	60	41	6	White, fully No. 2.
492	—	.....	A C	Kathia	...	.....	—	41	0	Fine, small-berried, white and red, mixed.
493	—	.....	A	Raksi	...	.....	60	40	0	Small-berried, good, soft, white, better than No. 2.
772	—	.....	A C	Lalia	...	.....	—	40	0	Mixed, white and red, small-berried.
495	—	.....	A	Chunia	...	Much weevilled ...	59	39	0	Common, small-berried, soft, dirty white.
491	—	.....	—	Lalia	...	Destroyed by weevil.				
		Fyzabad District.								
708	—	.....	A	Safed	...	.....	—	44	0	Good, white, about No. 1.
719	—	.....	,,	Daudi	...	.....	—	43	6	Fine, white, about No. 1.
718	—	.....	,,	Gangajali	...	.....	—	43	0	Fine, white, about No. 1.
330	—	.....	,,	.....		Weevilled ...	60½	42	6	Fine, white, mixed, long-berried.
325	—	.....	,,	Safed	...	Mixed with oil-seeds, &c.	62	40	6	Fine, white, soft, regular, little dirty.
329	—	.....	,,	Kathia lalia	...	Weevilled ...	61½	40	0	Good, white, mixed, hardish.
324	—	.....	A D	Lalia	...	Ditto ...	63½	39	0	Good, mixed, mostly hard.
793	—	.....	C	Ditto	...	.....	—	39	6	Good, red.
794	—	.....	,,	Samadha	...	.....	—	39	6	Good, red, some white.
326	—	.....	—	Daudi	...					
327	—	.....	—	Samodhwa	...	Destroyed by weevil.				
328	—	.....	—	Gangajali	...					
		Gonda District.								
767	—	.....	A	Daudi	...	.....	—	45	6	White, superior No. 1.
682	—	.....	,,	Ujra	...	.....	—	44	0	Good, white, about No. 1.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Gonda District—contd.					s. d.	
768	—	.....	A	Gangajali ...	.....	—	42 6	White, nearly No. 1.
395	—	.....	,,	Ujra or Satua ...	.....	60	42 0	Fine, soft, white, rather dirty.
393	—	.....	A B	Samodwha ...	.....	62½	39 6	Good, white, mixed, hard.
396	—	.....	A	Gangajali ...	.....	61	39 0	Good, white, fully No. 2, mixed with seeds.
394	—	.....	B	Daudi ...	.....	63	41 0	Fine, clean, regular, mostly hard, white.
392	—	.....	B D	Lalia ...	.....	62	38 0	Good, hard, white, mixed, hard, red.
802	—	.....	C	Samodwha ...	.....	—	39 0	Good, red.
818	—	.....	,,	Lalia ...	.....	—	39 0	Ordinary, red.
		Lucknow Division. *Barabanki District.*						
741	—	.....	A	Gangajali safed ...	.....	—	44 0	White, about No. 1.
709	—	.....	,,	Lalia sagarha ...	.....	—	43 0	Good, white, about No. 1.
782	—	.....	,,	Muria ...	.....	—	43 0	Good, white, about No. 1.
710	—	.....	A C	Kathia ...	Weevilled ...	—	39 6	Ordinary, white.
367	—	.....	B	Murua ...	Ditto ...	—	39 0	Good, white and red, mixed.
755	—	.....	D A	Phul Khaja ...	Ditto ...	62	41 0	Fine, mixed, hard, white.
366	—	.....	—	Gangajali ...	.....	—	39 0	Good, red, hard, mixed with soft white.
368	—	.....	—	Lalia sakraha ...	Destroyed by weevil.			
369	—	.....	—	Kathia ...				
370	—	.....	—	Dina Sahi ...				
371	—	.....	—	Sita ...				
372	—	.....	—	Bulrampuri ...				
373	—	.....	—	Phul Khaja ...				
		Lucknow District.						
688	—	.....	A	Kathua ...	.....	—	44 0	Fine, white, about No. 1.
683	—	.....	,,	Sweta ...	.....	—	44 0	Fine, white, fully No. 1, semi-hard.
474	—	.....	,,	Seta ...	Much weevilled ...	60	43 6	Fine, small-berried, soft, white.
479	—	.....	,,	Kathua ...	.....	—	43 6	Good, white, better than No. 1.
748	—	.....	,,	Gangajali ...	.....	—	43 6	White, about No. 1.
766	—	.....	,,	Tamra ...	.....	—	42 6	Good, white, nearly No. 1.
476	—	.....	A B	Gangajali ...	.....	60½	41 0	Good, white, mixed with clear grain, about No. 2.
477	—	.....	A C	Dina Sahi ...	Partly eaten ...	61	40 0	Good, mixed, rather better than No. 2, some barley.
475	—	.....	B	Tamla ...	Few weevils ...	61½	42 6	Fine, clean, hard, white, few tares.
478	—	.....	,,	Lalia ...	Much weevils ...	62½	39 0	Good, hard, large-berried, white.
770	—	.....	C	Dina Sahi ...	.....	—	40 6	Good, red, some white.
		Unao District.						
359	—	.....	A	Saman ...	.....	—	48 0	Beautiful, soft, white.
361	—	.....	,,	Marua ...	.....	62½	46 0	Fine, white, like Californian.

633	—	.....	„	Muria	...	Weevilled	...	—	46	0	Fine, white, like Californian, but harder.
672	—	.....	„	Safeda	...	Ditto	...	—	45	0	Fine, white, fully No. 1.
778	—	.....	A C	Desi	...	.....		—	40	6	Mixed, white and red, soft.
364	—	.....	A	Ditto	...	Weevilled	...	59	39	6	Good, soft, white, but mixed with inferior large berry.
650	—	.....	B	Saman bargehuna	...	.....		—	41	0	Long-berried, hard.
360	—	.....	„	Ditto	...	.....		60	40	0	Fine, long-berried, hard, flinty, white.
362	—	.....	—	Marua	...	Insufficient for report.					
363	—	.....	—	Seta	...	Destroyed by weevil.					
365	—	.....	—	Desi	...	Insufficient for report.					
		SITAPUR DIVISION.									
		Hardui District.									
338	—	.....	A	Seta	...	Weevilled	...	62	44	6	Fine, white, large-berried, clean, mostly soft.
341	—	.....	„	Mundia	...	.....		62	44	6	Fine, small-berried, soft, white, superior No. 1.
667	—	.....	„	Sweta	...	.....		—	44	0	Fine, white, about No. 1.
759	—	.....	„	Kathia	...	.....		—	43	6	Fine, white, about No. 1.
707	—	.....	„	Daudi	...	Weevilled	...	—	43	6	Good, white, about No. 1.
668	—	.....	„	Sambharia	...	Ditto	...	—	43	0	White, about No. 1.
619	—	.....	„	Muria	...	Much weevilled	...	—	42	6	Fine, white, about No. 1.
340	—	.....	„	Samharia	...	Weevilled	...	62	41	6	Good, mixed, clean.
339	—	.....	—	Daudi	...	} Destroyed by weevil.					
342	—	.....	—	Kathia	...						
		Kheri District.									
386	—	.....	A	Sitia	...	.....		60½	45	0	Fine, soft, white, like Danzig, but dirty.
700	—	.....	„	Ditto	...	.....		—	43	6	Good, white, about No. 1.
774	—	.....	„	Kathia	...	.....		—	43	6	Good, white, about No. 1.
717	—	.....	„	Sambharia	...	Weevilled	...	—	43	0	Good, white, about No. 1.
385	—	.....	„	Ditto	...	.....		62½	42	6	Fine, round, clean, regular white, better than No. 1.
775	—	.....	A C	Muria	...	.....		60	39	0	Mixed, white and red, small-berried.
391	—	.....	A D	Gajra	...	Weevilled	...	57	39	0	Common, mixed, dirty.
819	—	.....	C A	Gajar	...	.....		—	41	0	Good, mixed, red and white.
821	—	.....	C	Lalua	...	.....		—	37	6	Ordinary red, some barley.
820	—	.....	„	Sagarhei	...	.....		—	37	0	Ordinary red, some barley.
390	—	.....	D	Sikurha	...	Mixed barley and pulse		—	26	0	Inferior red, very dirty.
387	—	.....	—	Muria	...	} Destroyed by weevil.					
388	—	.....	—	Kathua	...						
389	—	.....	—	Lalua	...						
		Sitapur District.									
350	—	.....	A	Mundia	...	.....		61	46	0	Fine, white, like Californian.
665	—	.....	„	Muria	...	.....		—	46	0	Fine, white, soft, superior No. 1.
349	—	.....	„	Lalia	...	Weevilled	...	61	43	0	Fine, soft, white.
696	—	.....	„	Ditto	...	.....		—	43	0	Good, white, about No. 1.
693	—	.....	„	Setua	...	.....		—	43	0	White, about No. 1.
351	—	.....	A B	Satua	...	.....		60½	42	0	Good, white, mostly soft, mixed with hard, thin.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Jhansi Division.						
		Jalaun District.					s. d.	
472	—	.....	A B	Pisia, white ...	.....	62½	40 0	Good, clean, long-berried, white, much mixed with rough, red, hard wheat.
473	—	.....	C	Pisia, red ...	Some weevil ...	61½	41 6	Fine, large-berried, red, good
814	—	.....	,,	Pisi doem ...	.....	—	39 0	Good, soft, red, long berry.
824	—	.....	,,	Basra ...	.....	—	37 6	Long-berried, red, hard, some soft.
471	—	.....	D	Bhusra ...	Weevilled ...	61	34 0	Rough, long-berried, mixed, hard, red.
470	—	.....	,,	Kathia ...	Ditto ...	60½	32 6	Inferior, large-berried, red, mostly hard and rough.
		Jhansi District.						
649	—	.....	B	Bakasia ...	Much weevilled ...	—	39 0	Long-berried.
317	—	.....	,,	Baugasia ...	Weevilled ...	59	38 6	Long-berried, hard, flinty, like Cubanca.
786	—	.....	C	Pisi ...	Ditto ...	—	39 6	Red, long berry, soft.
315	—	.....	D	Kathia ...	Ditto ...	60	34 0	Common, rough, inferior, red.
316	—	.....	—	Pisi ...	Destroyed by weevil.			
		Lallitpur District.						
638	—	.....	A	Pisi duem ...	.....	—	45 0	Fine, white, long berry, superior No. 1.
829	—	.....	,,	Kathia ...	.....	—	43 6	White, about No. 1.
448	—	.....	,,	Bhusra ...	Weevilled ...	60½	38 0	Common, rough, long-berried, white, fully half hard.
749	—	.....	A C	Chikrasia ...	Much weevilled ...	55	36 0	Mixed, white and red.
449	—	.....	,,	Khibrasia ...	Ditto ...	60½	35 0	Inferior mixed, rough, long berry.
646	—	.....	B	Jalah ...	Weevilled ...	—	40 0	Long-berried, hard, part soft.
645	—	.....	,,	Hasia mkasia ...	.....	—	39 6	Long-berried, hard, thin.
446	—	.....	,,	Kathia ...	.....	61	33 6	Common, rough, flinty, white.
817	—	.....	C	Pisi lal ...	.....	—	40 0	Fine, round, red.
451	—	.....	D	Pisi lal ...	Weevilled ...	59½	36 0	Hard, red, large-berried, some barley.
447	—	.....	—	Jalalia ...	} Destroyed by weevil.			
450	—	.....	—	Hanzia bangrasia ...				
452	—	.....	—	Pisi safed ...				
		Agra Division.						
		Agra District.						
623	—	.....	A	Ratta ...	Weevilled ...	—	42 0	White, fully No. 2.
319	—	.....	,,	Gajar ...	.....	63	42 0	Fine, long-berried, semi-hard, white.
622	—	.....	,,	,, ...	.....	—	41 0	White, about No. 2.
323	—	.....	A C	Gajar lal ...	.....	62	39 0	Good, mixed, long-berried, white and red.
752	—	.....	,,	Gajar ...	.....	—	38 6	Mixed, red and white.
322	—	.....	C	Laljawara ...	Weevilled ...	62	40 0	Good, red, few barleys, tares, &c.
807	—	.....	,,	Lalia ...	.....	—	40 0	Good, red.

808	—	.....	,,	Lal Khali	...	.....	—	38	6	Good, red, long berry.
318	—	.....	—	Mandia	...	} Destroyed by weevil.				
320	—	.....	—	Rata	...					
321	—	.....	—	Lal Kahis	...					
753	—	.....	—	.....						
		Etawah District.								
496	—	.....	A	Gajar	...	.....	61	44	6	Fine, white, fully No. 1.
731	—	.....	,,	Muria	...	Weevilled ...	59	44	0	Good, white, fully No. 1.
497	—	.....	,,	Anokha	...	.....	63½	43	6	Fine, white, long, semi-hard, clean.
689	—	.....	,,	Gajar	...	Much weevilled ...	—	43	6	Good, white, about No. 1.
627	—	.....	,,	Anokha	...	.....	—	43	6	White, about No. 1.
504	—	.....	,,	Lal pisia	...	.....	58½	42	0	Good, white, large-berried, mixed gram.
505	—	.....	,,	Madina	...	.....	62½	42	0	Fine, white, large-berried, mixed, red.
733	—	.....	,,	Pisia	...	Much weevilled ...	—	41	0	White, about No. 2.
503	—	.....	,,	Chelkna	...	.....	61	41	0	Soft, long-berried, rough and dirty.
736	—	.....	A C	Madnainya	...	.....	—	39	6	White, mixed, red.
498	—	.....	A	Mundia	...	Mixed barley and gram	60	37	0	Large-berried, good, white, few damaged grains, 42*s.* if cleaned.
806	—	.....	C	Kathia	...	.....	—	39	6	Good, red, soft, long berry.
501	—	.....	,,	Laltambia	...	.....	62½	38	6	Fine, large-berried, mixed, mostly red, clean.
811	—	.....	,,	,,	...	.....	59	37	0	Ordinary red.
499	—	.....	,,	Kathia	...	Weevilled ...	62½	36	0	Large-berried, soft, red, fine, but mixed with small gram.
500	—	.....	—	Samaria	...	} Destroyed by weevil.				
502	—	.....	—	Sukhdas	...					
734	—	.....	—	Chilkna	...	Lost.				
		Etah District.								
430	—	.....	A	Mundia	...	Few weevils ...	62	47	0	Fine, soft, clean, white, like Australian.
632	—	.....	,,	Sambharia	...	Weevilled ...	—	46	0	Fine, white, like Californian.
671	—	.....	,,	Ratta	...	.....	—	46	0	White, superior No. 1, soft, like Californian.
431	—	.....	,,	Samaria	...	.....	62½	43	0	Fine, soft, clean, white, like Spanish.
434	—	.....	,,	Rata	...	Much weevilled ...	60½	42	6	Fine, soft, large-berried, white.
432	—	.....	A B	Gajar	...	.....	62½	41	6	Fine, soft, white, mixed with hard.
673	—	.....	A	Gajah	...	Weevilled ...	—	41	0	White, about No. 2.
433	—	.....	A C	Katha	...	A few weevils ...	62	40	0	Good, mixed, mostly hard, about No. 1.
435	—	.....	B	Bhidia	...	.....	61	40	6	Long-berried, flinty, hard, like Cubanca.
648	—	.....	,,	Bhadia	...	.....	—	40	6	Long-berried, good.
771	—	.....	C	Kathia	...	.....	—	39	0	Ordinary red, some white.
		Furruckabad District.								
661	—	.....	A	Muria	...	Much weevilled ...	—	42	6	White, about No. 1.
511	—	.....	,,	Mundia	...	Weevilled ...	60½	42	0	Good, clean, white.
662	—	.....	,,	Sambharia	...	.....	—	41	6	White, about No. 2.
508	—	.....	,,	Safeda	...	.....	57	41	0	Good, soft, white, but very thin.
744	—	.....	,,	Sambharia	...	.....	—	41	0	Thin, white, about No. 2.
510	—	.....	A C	Gajar	...	Weevilled ...	60½	40	0	Long-berried, mixed, rather hard.
743	—	.....	,,	Ditto	...	.....	—	39	0	Mixed, red and white.
512	—	.....	A	Samaria	...	Weevilled ...	55	37	0	Small, thin, shrivelled, white.
506	—	.....	B	Ditto	...	A little weevilled ...	60½	41	0	Good, hard, white.
507	—	.....	,,	Ditto	...	Ditto ...	61½	40	0	Hard, large-berried, white, better than No. 2.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.				
			Colour and hardness.	Name.	Condition.	Weight.	Value.		Remarks.
							s.	d.	
		Furruckabad District—contd.							
509	—	.....	B D	Katha ...	.....	60	39	0	Common, mixed, hard.
796	—	.....	C	Kathia ...	.....	61	38	6	Good, red.
660	—	.....	—	Sambharia ...	Lost.				
		Muttra District.							
631	—	.....	A	Safeda ...	.....	—	46	6	Fine, white, like Californian.
303	—	.....	„	Ditto ...	.....	60½	41	0	Fine, white, soft, large-berried, but dirty, mixed with barley, requires cleaning.
304	—	.....	A C	Gajar ...	Weevilled ...	61	39	0	Large-berried, red and white, mixed barley.
760	—	.....	A D	Ditto ...	.....	—	38	0	Mixed, white, soft, and red, hard.
790	—	.....	C	Lal ...	.....	—	40	6	Good, red, soft.
815	—	.....	„	Lal awwal ...	.....	—	39	0	Good, red.
306	—	.....	„	Lal ...	Much mixed with barley	60	30	0	Common, long-berried, rough, red, unfit for milling.
305	—	.....	D	Ditto ...	Mixed with barley ...	61	32	0	Hard, large-berried, red, mixed with barley.
		Mainpuri District.							
635	—	.....	A	Sambharia ...	.....	—	40	0	Fine, white, like Californian.
634	—	.....	„	.....	.....	—	46	0	Fine, white, like Californian.
380	—	.....	„	Safeda ...	Weevilled ...	60	44	6	Fine, white, clean, long-berried.
674	—	.....	„	Lalia ...	.....	—	43	6	White, about No. 1.
381	—	.....	„	Muria ...	Much weevilled ...	60½	43	0	Fine, soft, white.
634	—	.....	„	Safeda ...	.....	—	42	0	Good, white, about No. 2.
382	—	.....	A D	Lalia ...	Much weevilled ...	63	40	0	Fine, long-berried, mixed, red, hard, soft, white.
379	—	.....	B	Anokha ...	Ditto ...	60½	42	0	Long-berried, flinty, hard.
653	—	.....	„	Ditto ...	.....	—	40	6	Long-berried, hard.
378	—	.....	—	Samaria ...	Destroyed by weevil.				
383	—	.....	—	Lalia ...	Insufficient for report.				
384	—	.....	—	Lirhia ...					
		Rohilkund Division. *Bareilly District.*							
625	—	.....	A	Sambharia ...	Weevilled ...	—	46	0	Fine, white, superior No. 1, soft.
677	—	.....	„	Pisia ...	.....	60	46	0	Fine, white, superior No. 1, soft.
692	—	.....	„	Katha ...	.....	—	45	0	Fine, white, superior No. 1, soft.
706	—	.....	„	Sambharia ...	.....	—	44	6	Fine, white, superior No. 1, soft.
624	—	.....	„	Muria purnaria ...	.....	—	43	6	White, about No. 1.
658	—	.....	„	Kathia paria ...	.....	—	43	6	White, about No. 1.
659	—	.....	„	Daudi ...	.....	—	43	6	White, about No. 1.
737	—	.....	„	Mundia ...	.....	—	43	0	White, about No. 1.

758	—	.....	,,	Bhamuan	...	.....	—	42	6	Good, white, about No. 1.
540	—	.....	,,	Bhambua (2)	...	A few weevils ...	60	42	0	Good, white, clean, better than No. 2.
549	—	.....	,,	Katha (2)	...	Weevilled ...	60½	41	6	Fine, white, about No. 1.
536	—	.....	,,	Mundia (1)	...	Ditto ...	61	41	6	Fine, mixed, about No. 1.
746	—	.....	A C	Ratua	...	.....	—	41	6	Good, white, thin, about No. 2.
537	—	.....	A	Mundia (2)	...	Weevilled ...	61	41	0	Good, white, small-berried, semi-hard, about No. 1.
745	—	.....	,,	Gajra	...	.....	—	41	0	Thin, white, about No. 2.
538	—	.....	,,	Ratna	...	Very much weevilled ...	56½	40	0	Fair, white, dirty, imperfectly threshed.
539	—	.....	,,	Bhambua (1)	...	Weevilled ...	60½	40	0	Fair, thin, white, about No. 2.
541	—	.....	,,	Hansa	...	Ditto ...	59½	40	0	Fair, white, semi-hard.
551	—	.....	,,	Mund panwaria	...	Ditto ...	61	40	0	Common, white, partly hard.
544	—	.....	,,	Gajra	...	Very much weevilled ...	56	38	0	Thin, poor, white.
644	—	.....	B	Barlamba	...	.....	—	41	0	Long-berried, hard, good, white.
550	—	.....	,,	Pasia	...	Weevilled ...	61	41	0	Good, hard, white.
547	—	.....	,,	Daudkhani	...	Ditto ...	59	38	6	Common, rough, hard, white.
548	—	.....	,,	Katha panwaria	...	Ditto ...	60½	38	0	Common, hard, white.
542	—	.....	C	Katha (1)	...	Weevilled ...	62	39	7	Fine, clean, red, fully equal No. 2.
809	—	.....	,,	Ditto	...	Much weevilled ...	—	37	0	Good, red.
543	—	.....	—	Lalua pahari	...	} Destroyed by weevil.				
545	—	.....	—	Samaria (1)	...					
546	—	.....	—	Ditto (2)	...					
765	—	.....	—	Muria Surkh	...	} Lost.				
552	—	.....	—	Burlumba	...					
		Budaon District.								
697	—	.....	A	Bhambua	...	.....	—	46	6	Fine, white, superior No. 1, soft.
698	—	.....	,,	Muria	...	.....	61	46	6	Fine, white, superior No. 1, soft.
617	—	.....	,,	Ratua	...	.....	61	46	0	Fine, white, superior to No. 1.
656	—	.....	,,	Raimunea	...	.....	—	45	0	Fine, white, like pearl barley.
616	—	.....	,,	Muria ratna	...	Much weevilled ...	—	43	6	White, about No. 1.
687	—	.....	,,	Ratua	...	.....	—	42	6	Good, white, superior No. 2.
723	—	.....	,,	Muria	...	Very much weevilled...	51	42	0	Good, white, about No. 1.
724	—	.....	,,	Katta	...	Ditto ...	49	42	0	Good, white, about No. 1.
686	—	.....	,,	Sambharia	...	Much weevilled ...	53	41	6	White, about No. 2.
783	—	.....	,,	Gajar	...	.....	59	41	6	White, about No. 2.
655	—	.....	B	Ratua	...	.....	—	40	6	Long-berried, hard.
		Mooradabad District.								
714	—	.....	A	Muria awwal	...	.....	62	47	0	Fine, white, superior No. 1, like pearl barley.
613	—	.....	,,	Mundia	...	Some weevil ...	—	46	0	Fine, white, small berry, good colour, superior No. 1.
728	—	.....	,,	Mandwa Kada	...	.....	60	46	0	Fine, white, small berry, superior No. 1.
727	—	.....	,,	Ditto	...	.....	61½	45	6	Fine, white, small berry, superior No. 1.
726	—	.....	,,	Muna safed	...	.....	61	45	0	Fine, white, small berry, about No. 1.
729	—	.....	,,	Safed	...	.....	59	43	6	Fine, white, small berry, round, about No. 1.
725	—	.....	,,	Batta awwal	...	.....	—	43	6	White, about No. 1.
691	—	.....	A C	Surkh	...	.....	—	40	0	Ordinary, mixed red and white, soft.
800	—	.....	C	Kathia	...	.....	62	39	0	Good, red, mixed with white.
801	—	.....	,,	Mundwa	...	.....	59	38	0	Good, red.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.				Remarks.
			Colour and hardness.	Name.	Condition.	Weight.	Value.		
		Shahjehanpur District.					s.	d.	
735	—	.....	A	Muria safed ...	.....	—	44	6	White, fully No. 1.
690	—	.....	,,	Samba ...	.....	—	44	0	Good, white.
705	—	.....	,,	Daudi ...	.....	—	43	6	Fine, white, about No. 1.
480	—	.....	,,	Ditto ...	..... Weevilled ...	60½	43	0	Fine, small-berried, soft, white, better than No. 1, few damaged grains.
779	—	.....	A C	Kathia ...	.....	—	41	0	Good, white, mixed red, nearly No. 2.
483	—	.....	,,	Katha ...	.....	59	40	0	Good, mixed, about No. 2, soft, mostly white.
482	—	,, ...	A	Mundia ...	.....	60½	38	0	Fine, white.
481	—	.....	B	Sambhari ...	Weevilled ...	60	40	6	Good, hard, white.
		KUMAON DIVISION. *Gurwhal District.*							
620	—	.....	A	.....	Much weevilled ...	52	43	6	Fine, white, about No. 1.
803	—	.....	C	.....	.....	60	38	6	Good, red.
		Kumaon District.							
618	—	.....	A	.....	Very much weevilled ...	—	43	6	White, about No. 1.
804	—	.....	C	.....	Much weevilled ...	—	35	6	Good, red.
		MEERUT DIVISION. *Aligarh District.*							
754	—	.....	A D	Gajar ...	.....	60	39	0	Mixed, white, soft, and red, hard.
628	—	.....	B	Ratta ...	.....	—	41	6	Good, hard, white.
643	—	.....	,,	Kathia ...	.....	58	41	0	Long-berried, hard.
787	—	.....	C	.....	.....	57	40	0	Good, red, soft.
788	—	.....	,,	Lal ...	Weevilled ...	53½	39	6	Red, long berry, soft.
		Bulundshahr District.							
459	—	.....	A	Safed ...	Sound ...	68	48	0	Fine, white, like Australian, soft, long-berried.
463	—	.....	,,	Gajar ...	.....	63½	47	0	Fine, white, like Australian, rather harder.
640	—	.....	,,	Safed ...	.....	—	46	6	Fine, white, like Californian, soft.
465	—	.....	,,	Mendha ...	.....	62½	46	0	Fine, white, like Californian, clean, regular.
638	—	.....	,,	Gajar ...	.....	—	46	0	Fine, white, superior No. 1, large berry.
626	—	.....	,,	Rutta ...	.....	62	45	6	Fine, white, superior No. 1.
462	—	.....	,,	Ditto ...	.....	63	45	0	Fine, mixed with hard, clean, white, better than No. 1.
657	—	.....	,,	Munia ...	.....	—	45	0	Fine, white, like pearl barley.
676	—	.....	,,	Munda ...	Much weevilled ...	—	43	0	Good, white, about No. 1.
460	—	.....	,,	Munia ...	.....	61½	41	6	Small, round, white, like pearl barley.
651	—	.....	B	Barha ...	.....	—	42	0	Long-berried, hard.
461	—	.....	,,	Ditto ...	.....	—	40	6	Very long, large, steely, white.
464	—	.....	C	Gehun lal ...	.....	62½	42	0	Fine, clean, regular, red, fully No. 1.
812	—	.....	,,	Lal ...	.....	—	40	0	Fine, red.

		Dehra Doon District.							
681	—	.....	A	Mihirta	...	.....	—	45 0	Good, white, superior No. 1.
680	—	.....	,,	Ditto	...	.....	—	44 0	Good, white, about No. 1.
666	—	.....	,,	Ditto	...	.....	62	43 6	Good, white, about No. 1.
720	—	.....	,,	Ditto	...	.....	60½	43 0	White, about No. 1.
442	—	.....	,,	Ditto	...	.....	60½	41 6	Good, small-berried, part hard, white, about No. 1.
441	—	.....	,,	Ditto (5)	...	.....	61	41 0	Good, white, nearly No. 1.
756	—	.....	A D	Ditto	...	.....	—	40 6	Good, white, mixed, red, about No. 2.
437	—	.....	A	Ditto (1)	...	.....	62	40 0	Good, white, semi-hard, dirty.
439	—	.....	,,	Ditto (3)	...	.....	61	39 6	Good, white, semi-hard, rather dirty.
440	—	.....	,,	Ditto (4)	...	Mixed with barley ...	58	22 0 to 27 0	Inferior, white, dirty, mixed with barley, unfit for milling.
438	—	.....	B	Ditto (2)	...	Badly cleaned ...	60	39 0	Fair, hard, white, better than No. 2.
789	—	.....	C	Lal gehun	...	.....	—	39 0	Good, red.
825	—	.....	,,	Kusar	...	.....	—	38 0	Good, red, soft.
798	—	.....	,,	Lal tondi dar	...	.....	—	37 0	Ordinary, red.
436	—	.....	,,	Lal ta rider	...	.....	61	37 0	Good, reddish, mixed barley, dingy.
445	—	.....	,,	Kusal	...	.....	—	36 0	Fair, soft, red, many shrivelled grains, and barley.
443	—	.....	,,	Lal gehun	....	Mixed with barley ...	60	33 0	Good, small-berried, red, tares and barley, a few white grains, require cleaning.
826	—	.....	,,	Mihirti	...	.....	59	30 6	Inferior, red, dirty, barley.
444	—	.....	—	Mundla	...	Insufficient for report.			
		Meerut District.							
397	—	.....	A	Safed	...	.....	62	48 0	Very fine, soft, white, like Californian.
629	—	.....	,,	.....	.....	.....	—	48 0	Very fine, soft, white, like Australian.
403	—	.....	,,	Monda	...	.....	62	47 0	Fine, round, soft, white, like Californian, clean, regular, some hardish.
641	—	.....	,,	Muria	...	.....	—	45 6	Fine, white, superior No. 1, stout.
399	—	.....	,,	Gajar	...	.....	62	44 0	Fine, white, better than No. 1.
701	—	.....	,,	Ditto	...	.....	—	44 0	Fine, white, fully No. 1.
401	—	.....	,,	Chunia	...	.....	63½	43 6	Very fine, small-berried, round, white, regular, like pearl barley.
400	—	.....	,,	Gajar	...	.....	61	42 0	Good, white, mixed, red, about No. 1.
757	—	.....	A C	Ditto	...	.....	58	41 6	Mixed white and red, small berry.
402	—	.....	B	Barha	...	.....	61	41 0	Very long, large, steely, white (fine).
654	—	.....	,,	Ditto	...	.....	—	40 6	Long-berried, hard.
398	—	.....	C	Surkh	...	.....	61½	41 0	Good, long-berried, clean, red, about No. 1.
813	—	.....	,,	Lal	...	.....	—	39 0	Good, red.
		Muzaffarnuggur District.							
699	—	.....	A	Safeda	...	.....	—	46 0	Fine, white, superior No. 1.
534	—	.....	,,	Ditto	...	.....	61½	44 0	Fine, white, soft, small-berried, better than No. 1.
678	—	.....	,,	Mundia	...	.....	—	43 0	White, about No. 1.
716	—	.....	,,	Gajra	...	.....	—	42 0	Good, white, about No. 2.
533	—	.....	B	Menda	...	.....	60	40 0	Fine, clean, hard, thin-berried, white.
805	—	.....	C	Surkh	...	.....	59	40 0	Good, red, soft.
532	—	.....	,,	Ditto	...	Weevilled ...	60½	39 0	Good, red, soft, clean, like Polish.
535	—	.....	—	Gajra	...	Destroyed by weevil.			

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Saharunpur District.					s. d.	
310	—	.....	A	Monda ...	.....	62½	46 6	Very fine, clean, semi-hard, white.
663	—	.....	,,	Muria ...	Weevilled ...	—	45 0	Fine, white, superior No. 1, soft.
769	—	.....	A C	Gajar ...	Much weevilled ...	—	38 0	Ordinary mixed red and white.
312	—	.....	B C	Gajar ...	Weevilled ...	60	40 0	Good, mixed, hard, white.
309	—	.....	C	Surkh ...	.....	62	40 0	Fine, small, red, some white, better than No. 2.
797	—	.....	,,	Ditto ...	.....	—	38 6	Good, red.
311	—	.....	—	Daudkhani ...	Destroyed by weevil.			
		AJMERE AND MHAIRWARRA.						
595	—	Mhairwarra ...	B	Katha safed ...	.....	59½	40 0	Long-berried, flinty, white.
592	—	Ditto ...	C	Kharcha baja ...	.....	64½	42 6	Long-berried, soft, very fine, red.
588	—	Ajmere ...	,,	Baja maigee ...	Weevilled ...	61	41 6	Long-berried, soft, fine, red, yellowish.
590	—	Ditto ...	,,	Baja kharcha ...	Ditto ...	62	41 0	Long-berried, soft, fine, red.
594	—	Mhairwarra ...	D	Katha lal ...	.....	60½	37 6	Long-berried, rough, flinty red.
589	—	.....	—	Baja sajwa ...	Lost.			
591	—	.....	—	Maigee baja ...				
593	—	.....	—	Kath baja ...				
		PUNJAB.						
		DELHI DIVISION.						
		Delhi District.						
273	—	Sonepal ...	A	Gundun safed ...	.....	65	48 0	Fine, white, like Australian.
274	—	Ditto ...	C	Gundun surkh ...	Weevilled ...	60½	40 0	Fine, red, yellowish.
		Gurgaon District.						
259	—	.....	C	.....	.....	64	41 6	Fine, yellowish, soft, red.
		Kurnool District.						
260	—	.....	C	Gehun lal ...	.....	53½	31 6	Inferior, thin, red, much mixed with barley and tares.
268	—	.....	—	.....	Lost.			
		HISSAR DIVISION.						
		Hissar District.						
296	—	.....	C	Kerletia ...	.....	61½	39 0	Good, small-berried, red, semi-hard.
229	—	.....	—	Kathuiya gehun ...	Lost.			
		Rohtak District.						
427	—	Barram land ...	C	Red wheat ...	Weevilled ...	62	41 0	Fine, red, yellowish.
422	—	Canal land ...	,,	Ditto ...	Ditto ...	61	39 6	Good, soft, red, few grams and barley.
420	—	Jhapar ...	,,	Ditto ...	Ditto ...	60	30 0	Good, red, mixed with barley, unfit for milling.
426	—	Well land ...	,,	Ditto ...	Ditto ...	59	30 0	Good, long-berried, red, very much mixed with barley, unfit for milling.
428	—	Dahri land ...	,,	Ditto ...	Ditto ...	58	28 0	Good, soft, red, half barley, unfit for milling.

429	—	Barram land ...	D	Bangra ...	Ditto ...	59½	33	0	Common, red, mixed with gram and barley.
421	—	.....	—	Red wheat ...					
423	—	.....	—	Daudkhani ...	Destroyed by weevil.				
424	—	.....	—	White wheat ...					
425	—	.....	—	Red wheat ...					
267	—	.....	—	.....	Lost.				
		Sirsa District.							
292	—	.....	A	White ...	Weevil ...	61	45	0	Fine, soft, small-berried, white.
291	—	.....	B	Brown ...	.....	60½	41	0	Good, hard, small-berried, white.
295	—	.....	C	Nali ...	.....	61	38	0	Good, soft, small-berried, red.
293	—	Dabwali ...	„	Brown ...	.....	55½	33	0	Common, red, mixed, gram and barley.
294	—	.....	D	Canal wheat ...	.....	61½	36	0	Common, semi-hard, small-berried, dingy red.
		UMBALLA DIVISION.							
		Umballa District.							
240	—	Naraingurh ...	B	.....	.....	62½	40	0	Good, hard, small-berried, white.
252	—	Manailla ...	C	.....	Weevilled ...	61	39	6	Good, soft, small-berried, red.
243	—	.....	„	.....	Much weevilled ...	61	39	0	Good, soft, red, yellowish.
241	—	Jagadhree ...	„	.....	Ditto ...	58	37	0	Small-berried, red, some barley.
239	—	Hurnaal ...	—	.....					
242	—	Jehsulpuplee ...	—	.....	Destroyed by weevil.				
238	—	.....	—	.....					
		Loodiana District.							
244	—	.....	C	.....	Little weevilled ...	61	38	6	Good, red, hardish.
258	—	.....	„	Red ...	Weevilled ...	60	38	0	Good, small-berried, red.
		Simla District.				61½	44	0	Fine, small, regular berry, soft.
257	—	Barowli ...	A	White ...	.....	60½	39	0	Good, red, semi-hard, small berry.
222	—	Ditto ...	C	Red ...	.....				
		JULLUNDUR DIVISION.							
		Hoshiarpur District.							
247	—	Unal tehsil ...	A	Daudkhani ...	Weevilled ...	62½	44	0	Fine, white, about half hard.
251	—	.....	C	Lal kanak ...	Much weevilled ...	60	40	0	Very fine, soft, small-berried, red, yellow.
245	—	.....	—	Berra ...					
246	—	.....	—	Daudkhani ...	Destroyed by weevil.				
248	—	.....	—	Ditto ...					
250	—	.....	—	Lal kanak ...					
		Jullundur District.							
264	—	.....	B	Kathee ...	Much weevilled ...	56½	33	0	Thin, hard, white, much mixed with barley, requires cleaning.
		Kangra District.				59	41	0	Good, white, but dirty.
256	—	.....	A	.....	Weevilled ...	62½	41	0	Good, white, small-berried, semi-hard.
263	—	.....	„	Kunku ...	.....	56	36	0	Inferior, dirty, thin, small-berried, white.
253	—	.....	„	Rungri ...	Weevilled ...				
		UMRITSUR DIVISION.							
		Umritsur District.							
276	—	.....	—	Vadanak ...	Destroyed by weevil.				
277	—	.....	—	Lal ...					
278	—	.....	—	Gaddar ...					
279	—	.....	—	Safaid ...					

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample. Colour and hardness.	Name.	Valuation and report. Condition.	Weight.	Value.	Remarks.
		Gurdaspur District.					s. d.	
227	—	Chahia ...	C	Lal kanak ...	.....	53	30 0 and 32 0	Common, red, mixed with barley and gram, unfit for milling.
		Sialkot District.						
265	—	Pathanwalla ...	C	Dagar ...	Much weevilled ...	55	32 0	Inferior, red, yellowish, much mixed with barley.
228	—	Jamki ...	—	.....	Destroyed by weevil.			
		LAHORE DIVISION. *Ferozepore District.*						
226	—	.....	A	.....	Much weevilled ...	59½	43 0	Good, soft, white.
269	—	.....	—	.....	Insufficient for report.			
		Gujranwalla District.						
254	—	.....	A	Vadanak ...	Weevilled ...	58	42 0	Long-berried, white, partly red, semi-hard.
		Lahore District.						
249	—	.....	A	.....	Much weevilled ...	59½	43 6	Fine, soft, small-berried, white.
255	—	.....	C	.....	Weevilled ...	59½	37 0	Good, thin, small-berried, red.
		MOOLTAN DIVISION. *Jhang District.*						
230	—	Kaluwala ...	A C	Rodi kanak ...	.....	60	41 0	Good, small-berried, semi-hard, white.
		Montgomery District.						
225	—	.....	—	Goni safed ...	Destroyed by weevil.			
		Mooltan District.						
271	—	.....	A	Makai kanak ...	Weevilled ...	57½	44 0	Fine, small-berried, white, mostly soft.
		Muzaffargarh District.						
231	—	Alipur ...	—	White ...	Destroyed by weevil.			
232	—	Ditto ...	—	Makki ...				
233	—	Sanawan ...	—	Wadang ...				
234	—	Bhuki ...	—	.....				
235	—	Ditto ...	—	Kohadu ...				
238	—	.....	—	Sanawan ...				
280	—	Kalandarwala ...	—	Gaji ...				
281	—	Umr Budh ...	—	White ...				
282	—	Kalandarwala ...	—	Paman ...				
		RAWALPINDI DIVISION. *Gujerat District.*						
283	—	.....	A	Dagur ...	Mixed with oil-seeds...	57½	38 0	Thin, long-berried, white, dirty.
285	—	Mukiana ...	D	Nikki ...	.....	53	35 6	Thin, inferior, long-berried, hard, red.
284	—	Hurbuspur ...	—	Jawagul ...	Destroyed by weevil.			

		Jhelum District.						
272	—	.....	C	Red ...	.....	61½	41 0	Fine, small-berried, red, yellowish.
		Rawalpindi District.						
266	—	.....	—	Red ...	Lost.			
		Shahpur District.						
410	—	.....	C	Ratti ...	Few weevils ...	61	41 0	Fine, large-berried, red, mixed with barley.
408	—	.....	,,	Ditto ...	Much weevils ...	59	37 0	Fine, soft, red, yellowish, mixed with barley, like Polish.
404	—	.....	—	Dagar ...	Destroyed by weevil.			
405	—	.....	—	Ditto ...				
406	—	.....	—	Radi ...				
407	—	.....	—	Soon kanak ...				
409	—	.....	—	Rati ...				
		PESHAWAR DIVISION.						
		Hazara District.						
275	—	Haripur ...	—	Red ...	Lost.			
		Kohat District.						
287	—	.....	A	Kulangi ...	Weevilled ...	57½	42 0	Long-berried, soft, rough, white.
288	—	Namilzai ...	,,	Ditto ...	.....	56½	40 0	Long-berried, white, semi-hard.
289	—	.....	C	Mirgandi sindi ...	Weevilled ...	56½	37 0	Common, soft, dingy red.
290	—	.....	,,	Ail sarki ...	Much weevilled ...	55½	34 0	Inferior, thin, common, red.
286	—	.....	—	Srah ganam ...	Destroyed by weevil.			
262	—	Miranzai ...	—	White ...				
		Peshawar District.						
224	—	Gurkhani ...	D	.....	Chaffy ...	47	26 0 and 29 0	Inferior, hard, red, very thin and chaffy.
		DERAJAT DIVISION.						
		Bannu District.						
261	—	.....	C	Marwat red ...	Much weevilled ...	58½	36 6	Common, soft, red.
223	—	Jahsil Mianwali ...	,,	.....	Ditto ...	54	32 0	Inferior, red, mixed with barley.
237	—	.....	—	Destroyed by weevil.				
		Dera Ghazi Khan.						
270	—	.....	—	White ...	Destroyed by weevil.			
		Dera Ismail Khan.						
411	—	.....	A	.....	Little weevilled ...	63	48 0	Fine, white, like best Californian.
412	—	.....	,,	Zurd kanak ...	Ditto ...	60½	44 6	Fine, soft, white, good, many damaged grains.
413	—	.....	C	Rutti kanak ...	Weevilled ...	60½	41 6	Fine, long-berried, soft, red.
415	—	Bhakkar ...	,,	.....	Ditto ...	60½	37 0	Long-berried, soft, red, mixed with barley.
414	—	.....	—	Surkh ...	Destroyed by weevil.			
416	—	.....	—	Zurd kanak ...				
417	—	.....	—	Ditto ...				
418	—	.....	—	Surkh ...				
419	—	.....	—	Rutti kanak ...				
		BOMBAY PRESIDENCY.						
		SIND.						
		Hyderabad District.						
1111	92	Naushahro ...	A	Shori ...	Some weevils ...	58½	43 0	No. 1, white.
1119	100	Hyderabad ...	,,	Goji ...	Ditto ...	57	42 0	White.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Hyderabad District—contd.					s. d.	
1104	85	Moro taluk ..	A	Makalen ...	Much weevilled ...	57½	41 0	Good, white, No. 1.
1110	91	Naushahro ...	,,	Shori ...	Weevilled ...	56	41 0	Small-berried, white.
1121	102	Hyderabad ...	,,	Khudna ..	Ditto ...	54	37 0	Mixed.
1100	81	Kandiero tal ...	B	Gaj ...	Ditto ...	61	39 0	Large-berried, hard.
1102	83	Ditto ...	,,	Shori ...	Ditto ...	54	39 0	Small, hard.
1099	80	Ditto ...	,,	Kahani (bearded) ...	Ditto ...	61	38 6	Good, hard, white.
1107	88	Moro taluk ...	C	Pamban ...	A little weevilled ...	58	39 6	Fine, soft, red.
1101	82	Kandiero tal ...	—	.....	} Destroyed by weevil.			
1103	84	Ditto ...	—	.....				
1105	86	Moro tal ...	—	.....				
1106	87	Ditto ...	—	.....				
1108	89	Ditto ...	—	.....				
1109	90	Naushahro ...	—	.....				
1112	93	Ditto ...	—	.....				
1113	94	Ditto ...	—	.....				
1114	95	Hala ...	—	.....				
1115	96	Jaude ...	—	.....				
1116	97	Ditto ...	—	.....				
1117	98	Ditto ...	—	Garhi ...				
1118	99	Ditto ...	—	Pamban ...				
1120	101	Hyderabad ...	—	Ghari ...				
1121	103	.....	—	Karir ...				
		Kurrachee District.						
1129	110	Sewan division ...	A	.....	Much weevilled ...	56½	41 0	Fine, white.
1136	117	Ditto ...	,,	.....	Weevilled ...	55	41 0	Good, small-berried, soft, white.
1133	114	Ditto ...	,,	Popri, 1st sort ...	Ditto ...	52	40 6	Fine, soft, white.
1134	115	Ditto ...	,,	Popri, 2nd sort ...	Ditto ...	52	40 6	Fine, soft, white, small-berried.
1130	111	Ditto ...	,,	Shori, 1st sort ...	Ditto ...	54½	40 0	Good, small, white.
1138	119	Ditto ...	,,	Gauji ...	Ditto ...	53	38 6	Thin, white.
1128	109	Ditto ...	,,	.....	Ditto ...	52½	38 0	Small, white.
1132	113	Ditto ...	B	Kahnia, 1st sort ...	Ditto ...	55	36 6	Hard.
1135	116	Ditto ...	,,	Kahnia gaujo ...	Ditto ...	55	36 0	Hard, thin, white.
1139	120	.....	C	Pamban, 1st sort ...	Ditto ...	52	36 0	Soft, red.
1131	112	.....	—	Shori, 3rd sort ...	} Destroyed by weevil.			
1137	118	.....	—	Red ...				
1140	121	.....	—	Ditto ...				
1141	122	.....	—	Samban, 3rd sort ...				
		Shikarpur District.						
1090	61	Sukkur taluk ...	A	Shori ...	Little weevilled ...	58	43 6	Very fine, white.
1096	77	Mehar taluk ...	,,	Ditto ...	Ditto ...	57½	43 0	
1092	73	Sigar taluk ...	,,	Ditto ...	Ditto ...	58½	42 0	Fine, soft, white.

1079	60	Shikarpur taluk ...	,,	Khudain ...	Ditto ...	59	42	0	Short-berried, fine, white, clean.
1095	76	Kakar taluk ...	,,	Shori ...	Ditto ...	55	41	0	Good, white.
1074	55	Rohri division ...	,,	Khudayen ...	Ditto ...	57	41	0	Short, round, white, like pearl barley.
1081	62	Kambar taluk ...	,,	Shori, 1st sort ...	Ditto ...	58	41	0	Good, white, No. 1.
1091	72	Ratodero taluk ...	,,	Ditto ...	Ditto ...	58½	41	0	White.
1075	56	Rohri division ...	,,	Ditto ...	Much weevilled ...	56	40	6	Fine, white.
1073	54	Ditto ...	A C	Gahri gereri ...	Weevilled ...	58	40	0	Good, mixed.
1087	68	Sujawal tal ...	A	Shori, 2nd sort ...	Little weevilled ...	52	39	0	Small, soft, white.
1089	70	Larkhana tal ...	,,	Shori ...	Ditto ...	53	39	0	Soft, white.
1082	63	Kambar tal ...	,,	Shori, 2nd sort ...	Ditto ...	53½	38	0	White.
1072	53	Rohri division ...	B	Gaj ...	Much weevilled ...	55	38	0	Fine, hard, white.
1078	59	Naushahro tal ...	,,	Kahin ...	Little weevilled ...	57½	38	0	Hard, white.
1085	66	Rabdarga tal ...	,,	Gaj, 2nd sort ...	Ditto ...	56½	38	0	Hard, white.
1093	74	Sigar tal ...	,,	Kahno ...	Ditto ...	57	38	0	Hard.
1097	78	Mehar tal ...	,,	Gaj kahno ...	Ditto ...	56	37	0	Hard, rough.
1088	69	Larkhana tal ...	,,	Gaj ...	Ditto ...	52½	36	6	Hard, thin.
1083	64	Kambar tal ...	,,	Khano, 2nd sort ...	Ditto ...	57½	36	0	Hard.
1090	71	Ratodero tal ...	,,	Gaj ...	Ditto ...	54½	36	0	Hard.
1086	67	Sajawal tal ...	,,	Gaj, 1st sort ...	Ditto ...	53	35	0	Hard, dirty, inferior.
1076	57	Rohri division ...	—	Jawah ...					
1077	58	Naushahro tal ...	—	Shori ...					
1084	65	Labdarga tal ...	—	Gaj, 1st sort ...	Destroyed by weevil.				
1094	75	Kakar tal ...	—	Shori ...					
1098	79	Mehar tal ...	—	Kahno gaudi ...					
		Thur and Parkur District.							
1124	105	.....	B	Khahno, No. 2 ...	Weevilled ...	57	36	0	Hard.
1123	104	.....	—	Shori ...					
1125	106	.....	—	Gori gaji, No. 3 ...	Destroyed by weevil.				
1126	107	.....	—	Khodno, No. 4 ...					
1127	108	.....	—	Goji jowali, No. 5 ...					
		Upper Sind Frontier.							
1070	51	.....	A	Shori shadi ...	Little weevilled ...	59	43	6	Fine, white, better than No. 1.
1069	50	.....	A C	Kaisri ...	Ditto ...	61	40	0	Good, mixed, little barley.
1063	44	.....	,,	Red ...	Ditto ...	58½	39	6	Mixed.
1040	21	.....	,,	Kaisri garhi ...	Ditto ...	58	39	0	Mixed.
1047	28	.....	,,	Shir (red) ...	Ditto ...	55½	39	0	Mixed.
1051	32	.....	A	Kaisri jawati ...	Ditto ...	62	38	6	Mixed with barley.
1053	34	.....	A C	Garhi sanhi ...	Ditto ...	56½	38	6	Mixed, good.
1054	35	.....	,,	Jawali ...	Ditto ...	56½	38	6	Mixed, good.
1056	37	.....	A	Gaj kaisri ...	Ditto ...	52½	38	0	Mixed with barley.
1071	52	.....	A C	.....	Ditto ...	57½	38	0	Mixed.
1024	5	.....	,,	Garhi shori shuli ...	Ditto ...	56½	37	6	Mixed.
1023	4	.....	A	Achi shori ...	Much weevilled ...	55½	37	0	Good, white.
1049	30	.....	,,	Jawali ...	Ditto ...	54½	37	0	Mixed with barley.
1058	39	.....	,,	Garhi sanhi ...	Ditto ...	57	37	0	Mixed with barley.
1041	22	.....	,,	Kaisri garhi ...	Weevilled ...	53	36	0	Mixed with barley.
1045	26	.....	,,	Shori jawali ...	Ditto ...	56	36	0	Mixed with barley.
1020	1	.....	—	Sanhi garhi jowali ...	Lost.				
1021	2	.....	—	Ditto ...	Destroyed by weevil.				
1022	3	.....	—	Sanhi shori ...					
1025	6	.....	—	Garhi shori ...					

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Upper Sind Frontier—contd.					s. d.	
1026	7	.....	—	Bhuri shori ...				
1027	8	.....	—	Gaj shori jawali ...				
1028	9	.....	—	Khudain ...				
1029	10	.....	—	Shori achi ...				
1030	11	.....	—	Red, mixed ...				
1031	12	.....	—	Achi shori ...				
1032	13	.....	—	Shori ...				
1033	14	.....	—	Shori saf shuli ...				
1034	15	.....	—	Shori ...				
1035	16	.....	—	Red jawali ...				
1036	17	.....	—	Ditto ...				
1037	18	.....	—	Shori garhi ...				
1038	10	.....	—	Shori or bald ...				
1039	20	.....	—	Shori jawali ...				
1042	23	.....	—	Jawali ...				
1043	24	.....	—	Ditto ...				
1044	25	.....	—	Saf shori jawali ...	Destroyed by weevil.			
1046	27	.....	—	Shori jawali ...				
1048	29	.....	—	Ditto ...				
1050	31	.....	—	Garhi sanhi jawali ...				
1052	33	.....	—	Jawali kaisri ...				
1057	38	.....	—	Achi jawali ...				
1055	36	.....	—	Jawali ...				
1059	40	.....	—	Shori garhi ...				
1060	41	.....	—	Jawalai ...				
1061	42	.....	—	Shori jawali ...				
1062	43	.....	—	Red ...				
1064	45	.....	—	Shori ...				
1065	46	.....	—	Shori jawali ...				
1066	47	.....	—	Ditto ...				
1067	48	.....	—	Ditto ...				
1068	49	.....	—	Shori saf ...				
		Native States in Guzerat.						
1	—	Gondal ...	D	.....	.....	59	37 6	Hard, long-berried, red.
1a	—	Ditto ...	,,	.....	.....	58½	37 6	Hard, long-berried, red, flinty.
2	—	Limri ...	,,	.....	.....	58½	37 6	Large-berried, red, flinty.
2a	—	Ditto ...	,,	.....	.....	60	37 6	Thin, long-berried, red, flinty.
3a	—	Morvi ...	,,	.....	.....	58½	37 6	Thin, long-berried, red, flinty.
3b	—	Ditto ...	,,	.....	.....	60½	37 0	Thin, long-berried, red.
		Districts of the Bhownuggur State.						
25	—	Gadhada ...	B	Hasia ...	.....	60½	40 6	Long-berried, white, mostly hard.

19	—	Bhab ...	„	Ditto ...	.....	60	39	0	Long-berried, hard, white, flinty, mixed with reddish.
15	—	Sihor ...	C	Vajia ...	.....	58	40	6	Long-berried, red, mostly soft.
22	—	Botad ...	„	Patalia ...	.....	58	40	6	Long-berried, red, semi-hard.
9	—	Kundla ...	C D	Ditto ...	.....	59½	40	6	Long-berried, semi-hard, mixed, flinty.
7	—	Ditto ...	„	Vajia ...	.....	58½	40	0	Long-berried, red, mixed, semi-hard.
11	—	Sihor ...	„	Katha ...	.....	59	40	0	Long-berried, red, semi-hard, good.
13	—	Mahwa ...	„	Ditto ...	.....	61	40	0	Long-berried, red, semi-hard.
17	—	Ditto ...	„	Patalia ...	.....	61½	40	0	Good, semi-hard, red.
12	—	Jalaja ...	C	Ditto ...	.....	60	39	6	Small, semi-hard, red.
14	—	Sihor ...	C D	Ditto ...	.....	61½	39	0	Long-berried, red, semi-hard, good.
18	—	Daskroi ...	C	Vajia ...	.....	63	39	0	Long-berried, red, semi-hard.
20	—	Gadhada ...	„	Patalia ...	.....	59½	39	0	Long-berried, red, semi-hard.
16	—	Lilia ...	D	Kathia ...	.....	57½	39	0	Long-berried, red, flinty.
23	—	Daskroi ...	„	Ditto ...	.....	57	39	0	Long-berried, red, flinty.
26	—	Lilia ...	„	Vajia ...	.....	58	39	0	Long-berried, red, flinty.
27	—	Umrala ...	„	Ditto ...	.....	61	39	0	Long-berried, red, flinty.
6	—	Bhab ...	„	Katha ...	.....	59½	38	6	Long-berried, red, flinty.
8	—	Umrala ...	„	Chasia ...	.....	58½	38	6	Long-berried, red, flinty.
21	—	Gadhada ...	„	Katha ...	.....	57½	38	6	Long-berried, red, flinty.
24	—	Umrala ...	„	Ditto ...	.....	58	38	6	Long-berried, red, thin, hard.
10	—	Jalaja ...	„	Patalia ...	.....	58	38	0	Long-berried, red, flinty.
28	—	.....	—	.....	Destroyed by weevil.				
29	—	.....	—	.....					
		NORTHERN DIVISION.							
		Ahmedabad District.							
869	—	.....	BA	Chasia katha ...	.....	59	40	0	White, long-berried, mixed, hard and soft.
868	—	.....	D	Ditto ...	Much weevilled ...	54	35	6	Red, long-berried, hard, yellowish.
870	—	.....	—	Wadina ...	Destroyed by weevil.				
		Broach District.							
214	—	Wagra taluk ...	A	Pota ...	.....	57	42	6	Long-berried, white, like Spanish.
220	—	Ankleswar ...	„	Potia ...	.....	58	41	0	Long-berried, soft, white, like Spanish.
218	—	Ditto ...	A B	Katha ...	.....	57½	41	0	Long-berried, white, about semi-hard.
217	—	Wagra taluk ...	B	Hansia ...	.....	55	40	0	Long, white.
221	—	Jambusar ...	„	Ditto ...	.....	58	40	0	Hard, flinty, white.
219	—	Ankleswar ...	„	Ditto ...	.....	58	39	6	Long-berried, flinty, white.
215	—	Wagra taluk ...	„	Katha ...	.....	59	38	6	Long-berried, flinty, white.
5	—	.....	„	.....	.....	57½	38	6	Long-berried, flinty, white, earthy.
216	—	Wagra taluk ...	D	Jira ...	Much weevilled ...	53	36	0	Long-berried, rough, red.
4	—	.....	—	.....	Destroyed by weevil.				
		Kaira District.							
1008	—	Radoo taluk ...	D	Doodkhani ...	Badly weevilled ...	54½	36	0	Hard.
1007	—	.....	—	Katha ...	Destroyed by weevil.				
1009	—	.....	—	Wajia ...					
1010	—	.....	—	Katha ...					
		Khandesh District.							
41	D	Amalner taluk ...	A	.....	Some weevil ...	62½	43	0	Good, clean, regular, white.
580	G	Bhadgaon ...	B	Kalee Kusal ...	Ditto ...	61	42	6	Fine, stout, long-berried, hard, white.
605	K 2	Nasirabad ...	„	Bansi ...	.....	62½	42	6	Long-berried, flinty, white, fine.
607	L 2	Jamner ...	„	Ditto ...	Weevilled ...	55½	40	0	Long-berried, flinty, white, fine.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.				
			Colour and hardness.	Name.	Condition.	Weight.	Value.		Remarks.
		Khandesh District—contd.					s.	d.	
48	F 1	Nandurbar tal	B	.....	.....	59	40	0	Good, long-berried, flinty, white, fine.
51	F 4	Ditto ...	,,	.....	.....	59	40	0	Good, long-berried, flinty, white, fine.
941	R	Taluk Dhulea ...	,,	Pievale Pote ...	.....	60	40	0	Small, semi-hard, white.
943	T	.....	,,	Pievale Bansi ...	.....	61½	40	0	Fine, hard, white.
39	D 1	Amalner taluk	,,	.....	.....	58	39	6	Long-berried, hard, flinty, good white.
47	E 2	Taloda ...	,,	.....	Weevilled ...	59	39	6	Long-berried, hard, white.
50	F 3	Nandurbar taluk ...	,,	.....	.....	60½	39	6	Long-berried, flinty, white, good.
599	I 2	Sanda ...	B D	Bansi ...	.....	60½	39	6	Long-berried, flinty, rough, mixed.
612	N 2	Edalabad ...	B	Ditto ...	Weevilled ...	61	39	0	Long-berried, flinty, fine, white.
46	E 1	Taloda tal ...	,,	.....	Ditto ...	59	39	0	Long-berried, flinty, white, earthy.
35	C 1	Shahadu tal ...	,,	.....	.....	57½	38	6	Long-berried, flinty, white.
42	D 4	Amalner tal ...	B D	.....	.....	59	38	6	Long-berried, hard, mixed white and red.
942	S	Tal Dhalea ...	,,	Lal Kate ...	.....	60	38	6	Hard, mixed.
34	B 2	Pachora tal ...	B	.....	.....	58½	38	0	Long-berried, flinty, mostly white.
49	F 2	Nandurbar tal ...	,,	.....	.....	57	38	0	Good, flinty, white, earthy.
602	F 2	Yawal tal ...	B D	Kate ...	.....	60	37	6	Long-berried, mixed, mostly hard.
946	P	Kirdel tal ...	,,	Bansi ...	Slightly weevilled ...	58½	37	0	Hard, mixed.
945	O 2	Sirpar tal ...	B	Berad Bansi ...	Badly weevilled ...	56	35	0	Rough, hard.
209	F 6	Pimpalner tal ...	C D	.....	.....	61	38	6	Long-berried, red, mixed hard and soft.
208	F 5	Ditto ...	D	.....	Weevilled ...	57½	38	0	Long-berried, red, flinty, good.
598	I 1	Sanda ...	,,	Nun Bausi ...	.....	62	37	6	Long-berried, rough, flinty.
610	M 3	Bhusawal ...	,,	Bansi ...	.....	62	37	6	Long-berried, rough, flinty, good, red.
600	I 3	Sanda ...	,,	Kati ...	.....	58½	37	0	Long-berried, flinty.
601	J 1	Yawal ...	,,	Bansi ...	.....	61	37	0	Long-berried, flinty, good, mixed.
604	K 1	Nasirabad ...	,,	Kate ...	.....	61	37	0	Long-berried, flinty, rough.
33	B 1	Pachora taluk ...	,,	.....	.....	57	37	0	Long-berried, flinty, mostly red.
603	J 3	Yawal ...	,,	Nun Bansi ...	Weevilled ...	61	35	0	Long-berried, flinty, rough.
940	Q	Taluk Dhulia ...	,,	Lal Pote ...	.....	56	35	0	Dark, thin, red.
597	H 2	Chupra tal ...	,,	Kate ...	Weevllied ...	—	34	0	Long-berried, flinty, rough.
31	A 1	Erandol tal ...	—	.....					
32	A 2	Ditto ...	—	.....					
36	C 2	Shahada tal ...	—	.....					
40	D 2	Amalner tal ...	—	.....					
596	H 1	Chupra tal ...	—	Bansi ...	Destroyed by weevil.				
606	L 1	Jamner tal ...	—	Kate ...					
608	M 1	Bhusawal ...	—	Bansi ...					
609	M 2	Ditto ...	—	Ditto ...					
611	N 1	Edalabad ...	—	Lal ...					
944	O 1	Taluka sirpar ...	—	Pote ...					
		Nassick District.							
999	—	.....	B	Banshi, yellow ...	Weevilled ...	57	40	0	Very fine, hard, white.
1003	—	.....	,,	Kate Pote ...	Ditto ...	61	40	0	Very hard, dark white.

1005	—	.....	,,	Pote, yellow ...	Ditto ...	63	40	0	Fine, hard, white.
1000	—	.....	,,	Banshi, red ...	Much weevilled ...	61	39	6	Fine, hard, white.
1004	—	.....	D	Khuple ...	Weevilled ...	54½	36	0	Thin, hard, red, little husky.
1001	—	.....	—	Dawood Khani ...	} Destroyed by weevil.				
1002	—	.....	—	Kate, red ...					
1006	—	.....	—	Pote, red and yellow ...					
		Punch Mehals.							
1011	—	.....	B	Daudkhani ...	.....	62	42	0	Very fine, large-berried, hard, white.
1013	—	.....	,,	Katha malvi ...	Little weevilled ...	61	40	6	Good, hard, white.
1014	—	.....	,,	Gamadrov (1) ...	.....	58	40	0	Hard, white, good colour.
1016	—	.....	,,	Ditto (3) ...	Badly weevilled ...	59	39	6	Very good, hard, white.
1015	—	.....	,,	Ditto (2) ...	Ditto ...	58½	38	0	Good, hard, white.
1018	—	.....	,,	Katha (2) ...	Ditto ...	58	37	6	Hard.
1012	—	.....	—	Daudkhani (2) ...	} Destroyed by weevil.				
1017	—	.....	—	Katha (1) ...					
1019	—	.....	—	Wajia ...					
		Surat District.							
962	—	Taluka Bardki ...	—	Pota. ...	} Destroyed by weevil.				
963	—	Taluka Olpar ...	—	Hansia ...					
964	—	Ditto ...	—	Katha ...					
		Thana District.							
43	—	.....	B	.....	.....	59	40	0	Good, round-berried, white, flinty.
44	—	.....	,,	.....	.....	57	38	6	Thin, long-berried, white, flinty.
45	—	.....	C	.....	.....	61	38	0	Good, large-berried, red, yellowish.
		SOUTHERN DIVISION.							
		Ahmednuggur District.							
300	—	.....	—	.....	} Destroyed.				
301	—	.....	—	.....					
302	—	.....	—	.....					
		Belgaum District.							
207	—	Sampgaon taluka ...	A C	.....	Weevilled ...	58½	43	0	Fine, soft, mixed, red and white.
30*b*	—	.....	D	.....	.....	58	37	6	Long, thin-berried, red.
204	—	Athni taluka ...	,,	.....	Weevilled ...	59	37	6	Long-berried, flinty, red.
205	—	Ditto ...	,,	.....	Ditto ...	56½	37	0	Long-berried, flinty, red.
206	—	Parasgad taluka ...	,,	.....	Ditto ...	58	37	0	Long-berried, flinty, red, thin.
30*c*	—	Gokak ...	,,	.....	.....	57½	36	6	Long-berried, flinty, red, thin.
207*a*	—	.....	,,	.....	.....	—	36	6	Long-berried, flinty, red.
38	—	Chikori taluk ...	,,	.....	.....	57	36	6	Long-berried, flinty, red.
30*a*	—	.....	,,	.....	.....	58	36	0	Long-berried, red, common.
30*d*	—	.....	—	.....	} Destroyed by weevil.				
37	—	Chikori taluk ...	—	.....					
		Dharwar District.							
581	—	.....	B	Wheat from Challisgaum (2 years acclimatised).	Few weevils ...	58	40	6	Fine, flinty, white.
584	—	.....	,,	Wheat from Jabbalpur-Shapwa (3 years acclimatised).	.....	61	40	0	Long-berried, hard, flinty, fine, white.
585	—	.....	,,	Wheat from Tasulgaum (3 years acclimatised).	Some weevils ...	59	39	0	Good, hard, flinty, chaffy, white.

Valuation of the samples of wheat, &c.—*continued.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Dharwar District—contd.					s. d.	
586	—	.....	D	Mixed Seine (3 years acclimatised).	.....	59	37 0	Long-berried, hard, flinty, mostly red, dirty.
587	—	.....	,,	.....	.....	63	34 6	Rough, long-berried, flinty, red.
582	—	.....	—	Wheat from Hoshungabad (2 years acclimatised).	Destroyed by weevil.			
583	—	.....	—	Wheat from Jabbalpur (2 years acclimatised).				
		Kaladgi District.						
52	—	.....	D	.....	Much weevilled ...	55½	36 6	Long-berried, red.
53	—	.....	,,	.....	Ditto ...	59	35 0	Common red.
		Poona District.						
965	—	.....	B	Bakshi gahu ...	.....	63	41 0	Fine, large-berried, hard, white.
967	—	.....	,,	Kate gahu ...	.....	63½	40 0	Very fine, hard.
966	—	.....	,,	Kali Kusal ...	.....	59	38 6	Hard, white.
969	—	.....	,,	Daud khani ...	.....	60	38 6	Thin, hard, good, white.
970	—	.....	,,	Pote gahu ...	.....	60½	38 0	Hard, white.
968	—	.....	D	Khapla or Jod ...	.....	59½	37 6	Thin, hard, red, brittle, husky.
		Satara District.						
994	—	Taluka Khutai ...	B	Buxi ...	.....	60	40 6	Good, hard, white.
976	—	Taluka Khanapur ...	,,	Shet ...	.....	61	39 6	Hard, white.
981	—	Taluka Wan ...	,,	Buxi ...	.....	54	39 6	Thin, hard, white.
998	—	Taluka Satara ...	,,	Ditto ...	Slightly weevilled ...	62½	39 6	Hard, white.
984	—	Taluka Palan ...	B D	Ditto ...	.....	62	39 0	Dark, hard, mixed.
991	—	.....	B	Kato ...	.....	61½	39 0	Large-berried, hard.
992	—	Taluka Fauli ...	,,	Shet ...	.....	60	39 0	Hard, mixed.
993	—	Taluka Wai ...	,,	Ghaolee ...	.....	61	39 0	Hard, mixed.
989	—	.....	,,	Shet ...	Rather weevilled ...	59	38 0	Hard.
985	—	Tal Koregaon ...	,,	Buxi ...	.....	61	37 0	Hard.
977	—	Tal Palan ...	D	Shet ...	.....	—	37 6	Hard, good, red.
972	—	Tal Tasgaon ...	,,	Ditto ...	.....	58	37 0	Hard, red.
978	—	Tal Walwa ...	,,	Buxi ...	.....	57	37 0	Hard, thin, red.
996	—	Ditto ...	,,	Khuple ...	.....	60	36 6	Hard, thin, red.
971	—	Taluk Tasgaon ...	,,	Ditto ...	.....	57	36 0	Hard, thin, red.
973	—	Taluk Kanid ...	,,	Buxi ...	.....	58½	36 0	Hard, dirty, red.
974	—	Ditto ...	,,	Khuple ...	.....	58	36 0	Hard, thin, red, husky.
975	—	Taluk Khanapur ...	,,	Ditto ...	.....	56½	36 0	Hard, thin, red, husky.
979	—	Taluk Wai ...	,,	Ditto ...	.....	55	36 0	Thin, red, little husky.
980	—	Taluk Wan ...	,,	Ditto ...	.....	56	36 0	Thin, red, hard.
982	—	Ditto ...	,,	Pote ...	.....	61	36 0	Thin, red, hard.
983	—	Taluk Palan ...	,,	Khuple ...	.....	54½	36 0	Thin, red, hard, little husky.

986	—	.....	,,	Kate	...	.....	59½	36	0	Hard, red, dirty.
987	—	.....	,,	Khuple	...	.....	57½	36	0	Hard, red, thin, husky.
990	—	Tal Satara ...	,,	Ditto	...	.....	58½	36	0	Hard, red, thin.
995	—	.....	,,	Kali Koosli	...	.....	57½	36	0	Hard, red, dirty.
997	—	Tal Jauli ...	,,	Khuple	...	.....	55½	36	0	Hard, red, thin, husky.
988	—	Tal Khatao ...	,,	Ditto	...	.....	58	35	0	Thin, red, husky.
		Sholapur District.								
959	—	.....	B	Baxi or Bansi	...	.....	61	37	6	Hard.
960	—	.....	D	Khapli or Jod	...	.....	54	34	0	Thin, hard, red, little husky.
		CENTRAL PROVINCES.								
		NERBUDDA DIVISION.								
		Baitul District.								
181	1	.....	A	Pissi	...	.....	63	46	0	Fine, soft, white, like Californian, but few red grains.
182	2	.....	B	Akdania	...	.....	63½	40	0	Large-berried, white, mostly hard.
183	3	.....	B C	Khamra	...	.....	62½	38	6	Long-berried, mixed soft and red.
184	4	.....	D	Kathia	...	.....	62½	37	6	Long-berried, mixed hard and soft, white.
		Chindwarra District.								
568	1	Linga ...	—	Pissi	...	} Destroyed by weevil.				
569	2	Kamarpuni ...	—	Bhokria	...					
570	3	Sonekhar ...	—	Kathya	...					
		Hoshangabad District.								
579	3	.....	A	Sohareea	...	Weevilled ...	—	48	0	If not weevilled, beautiful sample.
575	1	.....	,,	White Pissi	...	Ditto ...	62	48	0	Very fine, white, like Australian, soft.
576	2	.....	—	Red Pissi	...	} Destroyed by weevil.				
577	3	.....	—	Jellalea	...					
578	4	.....	—	Kathia	...					
		Nimar District.								
193	1	.....	A	Bansi	...	.....	—	41	0	Long-berried, stout, white.
194	2	.....	C	Dhunya	...	.....	—	40	6	Long-berried, hard, red, yellowish.
195	3	.....	D	Kathia	...	.....	—	37	6	Long-berried, flinty, red.
		Nursingpore District.								
199	1	.....	A	Pissi	...	.....	62	42	0	Fine, large-berried, white, mixed, hard, red.
200	2	.....	D	Kathia	...	.....	62	36	6	Rough, long-berried, red.
		JUBBULPORE DIVISION.								
		Damoh District.								
201*e*	*e*	.....	A C	Doosra	...	.....	64	39	6	Good, mixed, hard, white and redsome gram.
201*d*	*d*	.....	A D	Pissi	...	.....	60	38	0	Long-berried, red and white, hard and soft.
201*c*	*c*	.....	B D	Jalalia	...	.....	60½	37	6	Long-berried, hard, mixed.
201*a*	*a*	.....	D	Hansia	...	.....	62	37	6	Long-berried, flinty, red.
201*b*	*b*	.....	,,	Kateea	...	.....	61	37	6	Long-berried, flinty, red.
		Jubbulpore District.								
571	1	.....	—	Mundi	...	} Destroyed by weevil.				
572	2	.....	—	Kathia	...					
573	3	.....	—	Jalalia	...					
574	4	.....	—	Pinjara	...					
		Mandla District.								
171	3	.....	A	Pissi Sookrawali	...	.....	60½	46	6	Fine, small-berried, white, like Californian.
170	2	.....	,,	Pissi moondi	...	.....	56	41	0	Good, thin, white.

Valuation of the samples of wheat, &c.—*continued*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample.		Valuation and report.			
			Colour and hardness.	Name.	Condition.	Weight.	Value.	Remarks.
		Mandla District—contd.					s. d.	
172	4	.....	A	Jalalia (1) ...	.....	58½	40 6	Good, soft, white, few damaged grains.
174	6	.....	C	Bangasia ...	.....	57	38 6	Long-berried, red, soft.
175	7	.....	,,	Katia ...	.....	59	38 6	Long-berried, red, soft.
173	5	.....	,,	Jalalia (2) ...	Weevilled ...	55	37 6	Long-berried, red, soft, rough.
169	1	.....	—	Pissi lal ...	Destroyed by weevil.			
		Saugor District.						
165	2	.....	A	Pissi ...	.....	62½	46 0	Fine, clean, long-berried, white.
164	1	.....	B	Hansia ...	.....	62½	40 6	Long-berried, fine, flinty, white.
167	4	.....	,,	Jalalia ...	.....	61	40 0	Long-berried, flinty, white.
166	3	.....	D	Kathia ...	.....	62	37 6	Long-berried, flinty, red.
		Seoni District.						
189	5	.....	A	Mundi ...	.....	64	47 0	Fine, clean, white, like Californian.
188	4	.....	,,	Pissi ...	.....	59½	45 6	Fine, soft, white, few reddish.
187	3	.....	,,	Jalalia ...	.....	58½	41 6	Good, long, soft, white.
186	2	.....	C	Kathia ...	.....	60½	38 6	Long-berried, soft, red.
185	1	.....	,,	Bungasia ...	.....	59½	38 6	Long-berried, red, and soft.
		CHUTTEESGURH DIVISION.						
		Bilaspore District.						
567	3	.....	C	Kathia ...	.....	60	41 6	Fine, clean, small-berried, soft, red.
566	2	.....	,,	Red Pissi ...	.....	63	41 0	Fine, clean, small-berried, soft, red.
565	1	.....	,,	White Pissi ...	Few weevils ...	61	39 0	Good, soft, dingy red.
		Raipore District.						
563	2	Sanga ...	C	Red Pissi ...	Weevilled ...	61	39 0	Fine, stout, soft, red, few damaged grains.
564	3	Ditto ...	,,	Red Katia ...	Ditto ...	60½	39 0	Long-berried, soft, red.
562	1	.....	—	White Pisia ...	Destroyed by weevil.			
		NAGPORE DIVISION.						
		Balaghat District.						
192	3	.....	A	Bansi ...	.....	62	43 0	Fine, clean, large-berried, white.
190	1	.....	B	Pissi ...	.....	62	40 0	Good, hard, clean, white.
191	2	.....	D	Kathia ...	.....	61½	37 0	Long-berried, almost hard.
		Bhandara District.						
553	1	.....	—	Pissi ...	Destroyed by weevil.			
554	2	.....	—	Kathia ...				
555	3	.....	—	Havra ...				
556	4	.....	—	Bansi ...				
		Chanda District.						
178	3	.....	C	Mal Katteh ...	.....	60	38 6	Long-berried, hardish, red.
180	5	.....	,,	Mal havali ...	.....	60	38 6	Long-berried, soft, red.
176	1	.....	D	Katteh ...	.....	61½	37 6	Long-berried, flinty, red.
177	2	.....	,,	Kateh lal ...	.....	—	37 6	Long-berried, hard, flinty, thin, red.
179	4	.....	,,	Bansi ...	.....	61	37 0	Long-berried, hard.

		Nagpore District.							
198	3	.....	AB	Chawal Kathi ...	.....	61	38	6	Long-berried, soft, mixed, hard, flinty.
197	2	.....	B	Botka ...	Weevilled ...	61	40	6	Long-berried, fine, hard, thin, white.
196	1	.....	,,	Havra ...	Much weevilled ...	58½	39	0	Long-berried, hard, white.
		Wurdha District.							
561	5	Hurghenghat ...	D	Sonsalya ...	Weevilled ...	62	37	6	Long-berried, hard, flinty, red.
557	1	.....	—	Kathya ...	} Destroyed by weevil.				
558	2	.....	—	Havara ...					
559	3	.....	—	Bhokra ...					
560	4	.....	—	Lal Pisi ...					
		Upper Godavery District.							
168	1	.....	D	Kathi ...	.....	60	37	0	Long-berried, hard, red.
		BERAR.							
		EAST BERAR.							
		Omraotti District.							
879	—	Hartala ...	B	Bansi ...	.....	61	41	6	Long-berried, white, hard, thin.
881	—	Hatoornah ...	,,	Ditto ...	Much weevilled ...	56	40	0	Large-berried, white, hard, good.
873	—	Chandur ...	,,	Chaoul katee ...	.....	61	40	0	Long-berried, white, hard, greyish, good.
874	—	Ditto ...	,,	Bunsee gahun ...	Weevilled ...	60	40	0	Long-berried, white, hard, good.
875	—	Bulgaon ...	,,	Katiah gahun ...	Dirty ...	60	39	6	Long-berried, white, hard, grey.
871	—	Bhatkooli ...	,,	Bunshi gahun ...	Few weevils ...	60	38	0	Long-berried, white, hard.
876	—	Murhzapur ...	,,	Ditto ...	Much weevilled ...	58	38	0	Long-berried, white, hard, grey.
877	—	Bulgaon ...	,,	Katiah ...	Few weevils ...	59½	38	0	Long-berried, hard.
884	—	Murtizapur ...	,,	Ditto ...	.....	61	38	0	Long-berried, hard, white, dirty.
882	—	Chandur ...	D	Katiah gehun ..	.....	60	37	6	Long-berried, hard, red, good.
883	—	Morsi ...	,,	Ditto ...	Few weevils ...	59	37	0	Long-berried, hard, red, good.
880	—	Bulgaon ...	,,	Lal gehun ...	.....	61	37	0	Long-berried, hard, red, good.
878	—	Chandur ...	,,	Jode gehun ...	.....	58	36	0	Long-berried, hard, red, thin.
872	—	Bulgaon ...	—	Lal gehun ...	Lost.				
		Ellichpur District.							
923	—	Durriapur ...	B	Bansi ...	.....	60½	41	0	White, long-berried, hard.
918	—	Ellichpur ...	,,	Ditto ...	.....	60	40	6	White, long-berried, hard.
921	—	Mailghat ...	,,	Ditto ...	Mixed rape seed ...	62½	40	0	White, long-berried, hard, some earth.
920	—	Ditto ...	B D	Potia ...	Ditto ...	60½	39	0	Long-berried, mixed hard and soft.
919	—	Ellichpur ...	D	Katey ...	.....	60½	38	0	Red, long-berried, hard.
922	—	Mailghat ...	,,	Kattia ...	Weevilled ...	60½	37	0	Red, long-berried, hard.
924	—	Durriapur ...	,,	Katey ...	.....	59½	37	0	Red, long-berried, hard.
		Woon District.							
925	—	Pumner ...	B	Bukshi ...	Weevilled ...	60	40	0	Long-berried, hard.
926	—	Dabat ...	,,	Deshi ...	Much weevilled ...	57	40	0	Long-berried, hard, white.
927	—	Burrad ...	,,	Ditto ...	Ditto ...	59	40	0	Long-berried, hard, white.
928	—	Nandura ...	D	Ditto ...	Ditto ...	56½	36	0	Long-berried, hard, red.
		WEST BERAR.							
		Akola District.							
894	—	Akote ...	B	Bansi ...	.....	61	41	6	Long-berried, white, hard, good.
891	—	Ballapur ...	,,	Ditto ...	Weevilled ...	60	41	0	Long-berried, white, hard.
892	—	Jalgaon ...	,,	Bagayati ...	Some weevils ...	58	40	0	Long-berried, white, hard, ricey.
897	—	Akola ...	,,	Bansi ...	.....	61	39	6	Long-berried, white, hard, good but earthy.
885	—	Khamgaon ...	,,	Bakshi ...	.....	60	39	0	Long-berried, white, hard, grey.
886	—	Akola ...	,,	Chawal ...	Weevilled and dirty ...	60	38	6	Long-berried, white, hard, grey.

Valuation of the samples of wheat, &c.—*concluded.*

Valuation number of sample.	Number on sample as received.	Locality.	Description of sample. Colour and hardness.	Name.	Condition.	Weight.	Value. s.	Value. d.	Remarks.
		Akola District—contd.							
887	—	Khamgaon ...	B	Bansi ...	Much weevilled ...	55	38	0	Long-berried, white, hard, fair quality.
889	—	Ditto ...	,,	Ditto ...	Weevilled ...	59	38	0	Long-berried, hard.
898	—	Jalgaon ...	,,	Kathi ...	Much weevilled ...	57½	38	0	Long-berried, hard.
895	—	Ditto ...	C	Bagati bansi ...	Weevilled ...	58	39	0	Small-berried, red, soft, good.
888	—	Ditto ...	D	Bagayah bansi ...	.....	60	37	6	Long-berried, red, hard, grey.
893	—	Akote ...	,,	Kate ...	.....	60	37	6	Long-berried, red, hard, grey.
890	—	Akola ...	,,	Kathe ...	Weevilled ...	59	37	0	Long-berried, red, hard.
896	—	Ditto ...	,,	Bagati bansi ...	.....	59	37	0	Long-berried, red, hard, grey.
		Buldana District.							
908	—	Sarrangpur ...	B	Bansi ...	.....	61	41	0	Long-berried, white, hard.
914	—	Waghapur ...	,,	Ditto ...	.....	60	41	0	Long-berried, white, hard.
912	—	Gungakhed ...	,,	Ditto ...	.....	61	40	6	Long-berried, white, hard.
916	—	Ganapur ...	C	Pote ...	Few weevils ...	61½	40	0	Long-berried, red, good, soft, earthy.
909	—	Wadhoda ...	D	Bansi ...	.....	58	37	0	Long-berried, red, hard.
911	—	Sarrangpur ...	,,	Kathe ...	.....	59	37	0	Long-berried, red, hard.
917	—	Mugsari ...	,,	Ditto ...	Few weevils ...	60	37	0	Long-berried, red and white, hard.
907	—	Harsode ...	,,	Ditto ...	Weevilled ...	55½	36	6	Long-berried, red, hard.
910	—	Waghapur ...	—	Bansi ...	} Destroyed by weevil.				
913	—	Meuria ...	—	Pote ...					
915	—	Dattala ...	—	Ditto ...					
		Bassim District.							
900	—	Wakua ...	B	Bukshi ...	.....	60	40	0	White, long-berried, hard.
901	—	Rissode ...	,,	Ditto ...	.....	59	39	6	White, long-berried, hard.
905	—	Sirpoor ...	,,	Khattai ...	.....	60	39	6	White, mostly hard.
906	—	Ditto ...	C	Caodee ...	.....	61	41	0	Red, good, soft.
904	—	Rissode ...	,,	Botkai ...	.....	62	40	0	Red, long-berried, soft, good, some earth.
903	—	Ditto ...	,,	Khattai ...	.....	60	39	0	Red, long-berried, semi-hard.
902	—	Oomerkheir ...	,,	Sawali ...	.....	60	38	0	Red, long-berried, semi-hard.
899	—	Rissode ...	C D	.....	.....	62	37	6	Red, long-berried, mixed hard and soft.
		MADRAS PRESIDENCY.							
		Bellary District.							
842	—	Aloor Taluq ...	D	Java godama ...	Few weevils ...	60	37	0	Red, long berry, hard.
840	—	Gooty Taluq ...	,,	Salaku godama ...	Weevilled ...	58	36	6	Red, long berry, hard.
843	—	Todpaty Taluq ...	,,	Budda godama ...	.....	59	36	6	Red, long berry, hard.
839	—	Aloor Taluq ...	,,	Java godama ...	Badly weevilled ...	50	36	0	Red, long berry, spindley.
841	—	Adoni Taluq ...	,,	Potta godama ...	Much weevilled ...	—	35	0	Red, long berry.
961	—	Harpunhully Taluq ...	,,	Java godhi ...	.....	56	35	0	Thin, red, rather hard.
838	—	Gooty Taluq ...	—	Budda godama ...	Lost.				
844	—	Dharmsagur Taluq ...	—	Java godama ...	} Destroyed by weevil.				
929	—	Kutlighi Taluq ...	—	Java godama ...					
930	—	Ditto ...	—	Ditto ...					
931	—	Huvenhadgalli ...	—	.....	Broken and chaffy.				

		Coimbatore District.							
852	—	Oodoomulpetteh ...	D	Pottay godama ...	Musty ...	55	35 6		Red, small berry, hard, clean, ricey.
855	—	Collegal ...	,,	Javay godama ...	Much weevilled ...	54	35 6		Red, long berry, hard, thin.
854	—	Ditto ...	,,	Hodday godama ...	Weevilled ...	54	34 0		Red, long berry, inferior.
853	—	Pulladum ...	—	.....	Not threshed.				
851	—	.....	—	Samba godama ...	Not husked ...	—	—		A kind of spelt, no value.
		Cuddapah District.							
837	—	.....	D	Paramaty gothamalu...	Weevilled ...	59	37 0		Red, hard, small berry, dingy.
835	—	Pulwendula ...	,,	Budda gothamalu ...	Ditto ...	58	36 6		Red, hard, large berry.
836	—	Kadiry ...	,,	Java gothamalu ...	Ditto ...	52	36 6		Red, hard, spindley, chaffy.
		Kurnool District.							
847	—	Rajupalam ...	D	.....	.....	58	37 6		Red, long berry, hard.
850	—	Kankanooroo ...	,,	.....	Weevilled ...	58	37 6		Red, long berry, hard, good.
848	—	Mundlapad ...	,,	.....	Ditto ...	56	37 0		Red, long berry, hard.
849	—	Sivavaram ...	,,	.....	.....	57½	36 6		Red, long berry, hard.
846	—	Billalapuram ...	,,	.....	Weevilled ...	55	34 6		Red, long berry, hard, inferior, thin, dirty.
845	—	Allur ...	—	.....	Lost.				
		Kistna District.							
834	—	Narsarowpeta ...	D	.....	Much weevilled ...	59	35 6		Red, hard, dirty.
833	—	Nuzanul division ...	—	.....	Lost.				
		Nilgherry District.							
856	—	Ootacamund ...	—	.....	Not husked ...	—	—		A kind of spelt, no value.
		Tinnevelly District.							
857	—	Idakal tenkasi ...	—	.....	Not husked ...	—	—		A kind of spelt, no value.
		MYSORE.							
864	—	.....	D	Hotte godhi ...	.....	60	37 6		Red, good, large berry, hard.
859	—	Betmangala ...	,,	Java godhi ...	.....	—	36 0		Red, long berry, hard, spindley.
867	—	Bangalore ...	,,	Hotte godhi ...	Few weevils ...	59	35 6		Red, long berry, hard, inferior.
957	—	Chittledrug taluk ...	,,	Java godhi ...	.....	55	35 0		Thin, hard, red, a little husky.
953	—	Hoomali taluk ...	,,	Hotte godhi ...	Unsuitable ...	—	—		Very dark red, hard.
955	—	Hosdrug taluk ...	D	Hotte godhi ...	Unsuitable ...	—	—		Dark, hard, red.
858	—	Kolar taluk ...	—	Java godhi ...					
860	—	Mulbagul ...	—	Ditto ...					
861	—	Malur ...	—	Ditto ...	Not husked ...	—	—		A kind of spelt, no value.
862	—	Sidlagutta ...	—	Ditto ...					
863	—	Goribidnur ...	—	Ditto ...					
865	—	Gumnaya Kanpaly ...	—	Ditto ...	Lost.				
866	—	Ditto ...	—	Ditto ...					
932	—	Arkalgud ...	—	Ditto ...	Not husked ...	—	—		A kind of spelt, no value.
933	—	Chamagiri ...	—	Ditto ...					
934	—	Hiriyur ...	—	Hotte godhi ...	Destroyed by weevil.				
935	—	Chitaldrug ...	—	Jave godhi ...					
936	—	Banavar ...	—	Ditto ...	Not husked ...	—	—		A kind of spelt, no value.
937	—	Tarikere ...	—	Ditto ...	Chaffy.				
938	—	Ditto ...	—	Hotte godhi ...	Ditto.				
939	—	Chikmagalur ...	—	Jave godhi ...	Ditto.				
951	—	.....	—	Hotte godhi ...	Insufficient for report,				
952	—	Moosoor ...	—	Java godhi ...	Ditto.				
954	—	Nursepur ...	—	Ditto ...	Half in chaff.				
956	—	Powghur ...	—	Ditto ...	In the chaff.				
958	—	.....	—	.....	Destroyed by weevil.				
		BURMA.							
		Pegu District.							
202	—	Thayetmyo ...	D	.....	.....	55	35 0		Common, large-berried, red.
203	—	Ditto ...	,,	.....	.....	58	33 6		Common, large-berried, red, much mixed with barley.

No. 35, dated India Office, London, the 8th March 1877.

From—Her Majesty's Secretary of State for India,
To—The Government of India.

In continuation of my despatch of the 21st December last, No. 130, I transmit a copy of a letter, with enclosures, from Consul-General Archibald, received through the Foreign Office, regarding the grading and shipment of wheat at Chicago, Milwaukee and New York.

Dated 31st January 1877.

Dated New York, the 31st January 1877.

From—E. M. ARCHIBALD, Esq., C.B., Her Britannic Majesty's Consul-General at New York,
To—Her Majesty's Secretary of State for Foreign Affairs.

I have the honour to acknowledge the receipt of Mr. Lister's despatch (Commercial No. 4) of 23rd ultimo, transmitting copies of a letter and its enclosures from the India Office, containing enquiries as to the system of inspecting grain carried out at Chicago and Milwaukee, and the means adopted for preventing any adulteration of the wheat, instructing me to furnish Your Lordship, for communication to the Secretary of State for India, with such particulars as I might be able to obtain in regard to this matter.

Upon receipt of this despatch, I applied to the officers of the Produce Exchange in this city for the needful information in reference to the abovementioned subject-matter, and learnt that, in order to obtain full and accurate details, it was necessary to communicate with Chicago and Milwaukee. This duty was cheerfully undertaken at my request by the Superintendent of the Produce Exchange of this city, from whom I have this day received a communication, of which a copy is herewith transmitted, accompanied by the several documents therein specified and referred to.

These will be found to contain, I trust, all the information sought by the Indian Government, together with other useful and interesting statistics in relation to the production and treatment of grain in the North-Western States.

I enclose also, for such information as it may contain, a copy of a letter received by me from Messrs. David, Dows and Company, one of the principal firms engaged in the grain trade of New York.

The time necessarily required for procuring the information in question has prevented my replying to Mr. Lister's despatch at an earlier date.

Dated New York, the 31st January 1877.

From—S. H. GRANT, Esq., Superintendent, Produce Exchange New York,
To—Her Britannic Majesty's Consul-General at New York.

In response to the request made us by you through your Secretary, Mr. Hoare, we have had a statement prepared by the Inspector-in-Chief

of Grain at this port, of the manner in which his inspection is made, which will serve to illustrate the manner in which grain is inspected at Chicago, Milwaukee and other western ports.

To recapitulate. The first thing required is a *standard* for each grade of wheat, maize, rye, oats, barley, &c., by which the Inspector-in-Chief is guided in giving the proper grade to the several lots that come under his eye. These standards are made up as early in each season as the receipts from the new crop suffice to determine its character accurately; for no two seasons correspond exactly to each other in quality, weight, colour, &c.

The second requisite is good *inspection*, which involves having a man as Inspector-in-Chief who is able to discriminate by eye, touch and smell the several qualities of grain that pass before him, and whose moral character is such as to withstand the efforts that are naturally made by receivers to have a higher grade than that to which it properly belongs.

Next the grain is weighed; and this enables the Railway Company (or the warehouseman) to issue to the consignee a *certificate* entitling him to a specified quantity of grain of a specific grade. This certificate is negotiable, and passes from hand to hand in lieu of the grain itself.

A factor wishing to make a shipment of a particular kind of grain presents to the Railroad Company (or the warehouseman) sufficient of these certificates for his purpose, with instructions to put the grain on board or alongside of a certain vessel, or it may be on a train of cars. The rest is mechanical. The *car* may be locked through to its destination, but the *vessel* is under the care of its captain, who must see to its safe and proper carriage. In this country it is never accompanied by a supercargo, no matter how large the shipment may be.

Beside the statement of our Inspector-in-Chief above referred to, marked "*A*," I send you herewith as bearing more or less directly upon this subject—

"*B*."—The Grain Rules of the New York Produce Exchange, including the grades of grain for this port as established by our Committee on Grain.

"*C*."—Rules concerning the Inspection of Grain in the City of Chicago.

"*D*."—Railroad and Warehouse Laws of Illinois.

"*E*."—Annual Report of the Railroad and Warehouse Commissioners of the State of Illinois for year ending 31st October 1875. This contains the Annual Report of the Chief Grain Inspector. (This is the last published volume.)

"*F*."—Rules of the Milwaukee Chamber of Commerce for Inspection of Grain.

"*G*."—Eighteenth Annual Report of the Trade and Commerce of Milwaukee.

"*H*."—Eighteenth Annual Report of the Chicago Board of Trade.

Hoping that the above may serve the purposes of your enquiry.

Dated New York, the 18th January 1877.

From—Messrs. David, Dows & Co., New York,

To—Her Britannic Majesty's Consul-General at New York.

Your favour of the 15th instant has been received and noted; and in answer to the same, we would say that in Chicago the system of grading grain is under the supervision of duly appointed officers of the State, and the laws of the State are very stringent against frauds, &c.; added to this, the Board of Trade have committees who are constantly looking after and caring for the interests of the trade, in preventing or detecting any attempted frauds. For Milwaukee the system is the same, except perhaps that there are no State officials, the Board of Trade directing and appointing the Inspectors. We will further add that in these two cities, and indeed in all the principal accumulating points west, the interests of the cities and of their immediate trades demand that the grades as established shall be maintained fully, in order that the buyers of the east may be induced to make their purchases in those cities, thus making it for their interest that the grades they profess to sell shall be delivered. This is particularly the case as regards Milwaukee, and every safeguard is thrown around the inspection to preserve its uniformity.

As to the means adopted to prevent adulterations on the way to the seaboard, we can only say that there is no difficulty, nor has there been any, provided the grain is properly directed. For instance, grain shipped by lake to Buffalo should, and does, come through as shipped, when the consignee, at Buffalo is trustworthy, and proper care is taken in looking after the grain while being transferred at Buffalo. There is no other way to prevent adulteration that we know of.

It may be well just here to remark that we do not credit the stories that we hear from time to time of adulteration. It is too true, perhaps, that all trades have their black sheep; but the grain transportation is so conducted, that it rarely happens that the property is so situated that it can be tampered with.

In shipments from the west by railroads there is no transfer as a rule; therefore the grain as shipped reaches the seaboard. This applies mainly to shipments from east of the Mississippi river. When there are claims of mixtures, we think that, in a majority of them, if properly traced, it will be found that the trouble is at the starting-point; that is to say, poorer wheat shipped than called for. Any further information you may desire we will be pleased to give you, if in our power.

Extract from the Proceedings of the Government of India in the Department of Revenue, Agriculture and Commerce,—No. 3—189-204, *dated Simla, the 24th August* 1877.

Read again—

The Resolution, No. 1—39-50, recorded by the Government of India, under date the 14th March 1877, on the subject of the adoption of measures for improving the quality of Indian wheat.

Read—

A despatch from the Secretary of State for India, No. 35, dated the 8th March 1877, transmitting, in continuation of his despatch

of the 21st of December last, certain papers regarding the grading and shipment of wheat at Chicago, Milwaukee and New York.

RESOLUTION.—A Summary has been prepared in this office, from the papers forwarded by Her Majesty's Secretary of State, of the Rules in force in the chief grain centres of the United States relating to the inspection and grading of wheat and other grains.

2. The President in Council thinks it is desirable that this summary should be forwarded, in continuation of the Resolution of the 14th March, to all Local Governments and Administrations and Chambers of Commerce, with a request that they will be good enough to consider whether any similar system could be adopted in this country; and if so, to suggest in what way they think the Government could assist, by legislation or otherwise, in introducing and carrying into effect an efficient system.

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* Govt. of Madras.	Chief Commr. of Assam.
„ Bombay.	„ Ajmere.
„ Bengal.	Resident at Hyderabad.
„ the N. W. P. and Oudh.	Chamber of Com., Madras.
„ the Punjab.	„ „ Bombay.
Chief Commr. of Central Provs.	„ „ Calcutta.
„ British Burma.	„ „ Rangoon.
„ Mysore and Coorg.	„ „ Kurrachee.

ORDER.—Ordered, that a copy of this Resolution, with the Summary of the Rules for the inspection of grain in the United States, be forwarded to the * for the purpose indicated.

SUMMARY OF THE RULES FOR THE INSPECTION OF GRAIN IN THE UNITED STATES.

The system of inspection of grain adopted in the United States, which was referred to in paragraph 2 of the Secretary of State's despatch (Statistics and Commerce) No. 130, dated the 21st December 1876, circulated with the Resolution of the Government of India No. 1—39-50, dated the 14th March 1877, may be described as follows.

The object of the rules is to ensure the delivery of wheat and another food-grains of defined qualities to purchasers at shipping ports. The grains are divided into grades (the standard of each of which is authoritatively declared by commercial bodies) by duly constituted inspectors, who grant certificates showing the grade and quantity of each consignment brought to the port and warehoused by the Railway Company. The holders of the certificates (which are transferable) are entitled to delivery from the Railway Company of the quantity and quality of grain specified therein. The inspectors are remunerated by inspection fees.

The first thing required in this system is a *standard* for each grade of wheat and other food-grains by which the Inspector-in-Chief is guided in giving the proper grade to the several lots that come under his

inspection. These standards are made up as early in each season as the receipts from the new crop suffice to determine accurately the character of the crop.

The second requisite is good *inspection*, which involves having a man as Inspector-in-Chief who is able to discriminate by eye, touch and smell the several qualities of grain that pass before him, and whose moral character is such as to withstand the efforts that are made by receivers to secure for their grain a higher grade than that to which it should properly be assigned.

Next the grain is weighed; and this enables the Railway Company (or the warehouseman) to issue to the consignee a *certificate* entitling him to a specified quantity of grain of a specific grade. This certificate is negotiable, and passes from hand to hand in lieu of the grain itself.

A factor wishing to make a shipment of a particular kind of grain presents to the Railway Company (or the warehouseman) sufficient of these certificates for his purpose with instructions to put the grain on board or alongside of a certain vessel, or it may be on a train of cars. The rest is mechanical. The *car* may be locked through to its destination, but the *vessel* is under the care of her master, who must see to the safe and proper carriage of the grain. In New York the shipment is never accompanied by a supercargo, however large it may be.

New York Rules.

The details of the system of inspection at the port of New York are described by the Inspector-in-Chief as follows:—

"*Car grain, 'to be graded,'* arriving at the port of New York is handled in the following manner.

On its arrival, and upon notification by the Railroad Company, deputy inspectors, furnished with tryers and testers, enter the car, and after thorough examination of quality, condition and weight per bushel, affix a grade according to the existing standards established by the Committee on Grain of the New York Produce Exchange, which grade is noted on his inspection book opposite the car number, together with the consignee's name, weight per bushel, and remarks concerning any unusual condition of car or grain. The car is then taken charge of by the Railroad Company; and the deputy inspector's clerk copies the grade, &c., from his inspection book into the Railroad Company's grade book.

The Railroad Company then drill or separate the grain into lots by grades, and float or store it as they may require. Previous to storing, however, the car is weighed heavy, and after storing weighed light, by an employé of the Railroad Company, superintended by a deputy inspector of weights, who is an employé of the Inspector-in-Chief. A return in duplicate is then issued by the Railroad Company, giving date of inspection, number of bushels, grade of grain and consignee, and signed by the deputy inspector, the original of which is filed by the Railroad Company, and duplicate attached to a certificate issued by them to the consignee, stating that they (the Railroad Company) have so many bushels of such a grade of grain subject to their (the consignee's) order, and which is held under certain conditions.

Upon presentation of the certificate to the Railroad Company, with receipt and order attached, its face value in bushels of corresponding grade is delivered from any lot in the hands of the Railroad Company at their option; and in this manner the identity of particular lots being lost, the object of the system is accomplished.

Appeals from the decision of the Inspector-in-Chief are made by consignees calling for a re-inspection; in which case a person employed by the party calling the re-inspection, accompanied by a deputy inspector, examines the grain in question and agrees upon an average sample, which is submitted to the Committee on Grain; and where erroneous inspection has been made, they assess the inspector for the damages for the benefit of the consignee.

The rates for inspection at this port are for car grain 50 cents per car, and for grain in ship, boat or store 50 cents per 1,000 bushels or fraction.

The *tryer* is a pole about four and a half feet long, furnished at one end with a pointed brass cup, secured to the pole by a chain just long enough to allow the cup after being pushed down to any required depth in the car and pole withdrawn, to slip off and fill with grain, thus furnishing a sample from any depth or part of the car.

The *tester* is a beam scale furnished with a brass cup containing a certain known part of a bushel (the two-quart cup is in general use), and the beam so graduated as to show the proportionate weight in pounds per bushel.

The returns (original and duplicate) are made out after the following form :—

Form of Inspector's Return.

New York——————18——————

This is to certify that on the——————day of——————

18——————, I inspected——————bushels of number——————, consigned to——————in car No.——————, at the Hudson River terminus of the——————Railroad at

——————

——————*Inspector-in-Chief.*

per——————*Deputy.*

The *certificate* of the Railroad Company is as follows:—

*No.*_____

Railroad Certificate for Graded Grain—Quantity Guaranteed.

New York **Grade.**

OFFICE OF THE

_____RAILROAD COMPANY.

*New York,*_____18 .

The Presents certify that

*The*_____RAILROAD COMPANY *has received at*_____, *and will deliver the below-mentioned grade and quantity of Grain, in accordance with the rules of the New York Produce Exchange and of the Railroad Companies, as the same have been agreed to by the said Company* _____ [Insert quantity and grade.] _____ *for account of*_____*and delivered to*_____*or order, on payment of charges accrued subsequent to the date hereof.*

_____**Bushels**
_____

This certificate is not a valid delivery without accompanying coupons.

[This Order is to be used only upon the surrender of the Certificate to the Railroad Company.]

_____RAILROAD COMPANY.

No._____

*Please deliver on the Certificate hereto attached*_____ *bushels of*_____*to*_____*for* _____*account.*

_____18 . _____

*The*_____RAILROAD COMPANY

*Has this day received certificate No.*_____*for*_____ *bushels of*_____*with an order directing delivery of the grain to*_____

No._____

NEW YORK,_____18 . _____

Regulations of Inspection framed by the New York Grain Committee.

Inspectors shall, when necessary, make their reasons for grading grain fully known by notations on their books.

All wheat shall be weighed, and the weight entered on the inspection book.

Any duly authorised inspector of grain who shall be guilty of neglect of duty, or who shall knowingly or carelessly inspect or grade any grain improperly, or who shall accept any money or other consideration, directly or indirectly, for any neglect of duty or the improper performance of any duty as inspector of grain, and any person who shall improperly influence any inspector of grain in the performance of his duties as such inspector, shall be immediately reported to the Committee on Grain for its action.

The Inspector-in-Chief, and all persons inspecting grain under his direction, shall in no case make the grade of grain above that of the poorest quality found in any lot of grain, when it has evidently been mixed or doctored for the purposes of deception.

The said Inspector-in-Chief is hereby authorised to collect, until further notice, on all grain inspected under his direction as follows:—

For inspection and verification of track weights—50 cents per car-load.

For out inspection (when requested)—50 cents per 1,000 bushels, for which the Inspector-in-Chief shall issue an inspection certificate stating grade and quality.

Additional Regulations.

The Inspector-in-Chief shall, for the information of members, cause to be exhibited daily in the Exchange fair average samples of inspected and consolidated grain received by rail, and, when requested, shall give any general information he may possess respecting the quantity, quality or condition of grain arriving at any or all of the lines; but neither the inspector nor his assistants shall give any information whatever respecting specific parcels of boat-loads.

The Inspector-in-Chief may appeal to the Committee on Grain respecting the performance of his duties. In no case, however, shall he reveal to the Committee, or to any member thereof, the ownership of any grain submitted by him for consultation.

In accordance with a request of the Grain Trade, the Committee on Grain have established the following additional grades of oats and corn:—

No. 3 *white oats* shall be mainly white and not equal to No. 2 white in other respects.

No. 3 *oats.*—All merchantable oats unfit for No. 2 shall be graded No. 3.

No. 1 *mixed corn* shall be of choice quality, sound, dry and reasonably clean.

They have also amended the grade of 'rejected oats,' so as to read as follows:—

Rejected oats.—All oats damp, unsound, dirty or for any other cause unfit for No. 3 shall be graded 'rejected.' "

The Grain Rules of the New York Produce Exchange, including the grades of grain for that port as established by the Committee on Grain, are these :—

" Rules regulating the Grain Trade among Members of the New York Produce Exchange, adopted April the 6th, 1876.

Rule 1.—At the first meeting of the Board of Managers after their election, the President shall (subject to the approval of the Board) appoint, as a Committee on Grain, five members of the New York Produce Exchange, who are known as members of the Grain Trade. It shall be the duty of this Committee to properly discharge the obligations imposed upon them by these rules, and also to consider and decide all disputes arising between members dealing in grain which may be submitted to them. A majority of the Committee shall constitute a quorum ; but the Committee shall fill temporaray vacancies, if requested by either party, by some person or persons representing the same interest as the absent member or members, and a decision of a majority present at any hearing shall be final and binding, subject to Rule 25. They shall keep a record of their proceedings ; and a fee of 15 dollars shall be paid to the Committe for each reference case heard by them, to be paid by the party adjudged to be in fault, unless otherwise ordered by the Committee : Provided, however, that nothing herein shall prevent settlement of questions of difference by private arbitration, or as provided for in the Bye-laws.

Rule 2.—The Committee on Grain shall, during the month of September of each year, establish the grades of grain except for corn, the grade of which shall be established on or before the 1st of December. It shall also be the duty of the Committee on Grain to report from time to time to the Trade for adoption such regulations as they may think necessary for the inspection of grain ; and no change shall be made in such regulations, or in the grades so established, except at a meeting of the Trade to be called by the Committee on Grain, due notice of the changes proposed being posted on the Bulletin of the Exchange.

Rule 3.—Sales of grain made as prime before 3 P.M. shall be considered confirmed (when the grain is so located that an examination may be had promptly), unless notice of rejection for cause is given before 5-30 P.M. Sales of grain represented as not prime shall be deemed to be made on examination of bulk, and rejection shall be reported before 5-30 P.M.

Rule 4.—On sales of ungraded grain afloat, made before 3 P.M., in parcels of 5,000 bushels or over on one boat or barge, the day of sale and the two following working days (ending at 6 P.M. of last day), without regard to weather, shall be buyer's lay-days, without charge : on parcels less than 5,000 bushels as above buyer shall be allowed one lay-day less. If allowed to remain beyond such term, buyer shall pay seller all charges and expenses incurred in consequence of such delay, including insurance.

Rule 5.—Ungraded grain sold afloat before 3 P.M. shall be deemed ready for delivery, unless stated to the contrary at the time of sale. If boat is prevented from towing to deliver promptly when

ordered, buyer shall have the right to cancel the sale on reasonable notice to seller, provided boat shall be ordered before 5-30 P.M. of the day of purchase.

Rule 6.—On sales of grain in store, the day of sale and the three following work days, without regard to weather, shall be free of charge for storage to buyer.

Rule 7.—When grain is in store, and sold to be delivered afloat, buyer shall approve of quality before the cost of lighterage has been incurred.

Rule 8.—Sales of grain being made for cash, seller shall have the right to demand payment at the time of passing title.

Rule 9.—On ungraded grain not received within the term of lay-days or storage allowed, seller shall have the right to tender the delivery and demand payment.

Rule 10.—Ungraded grain, to be in prime order, shall conform in colour, berry and cleanliness with the standard samples of the crop sold. In condition it shall be cool, sweet and dry, suitable for shipment by sail vessels to European ports.

Rule 11.—Ungraded grain, to be of the grade called steamer, shall conform in colour, berry and cleanliness with the standard samples of the crop sold. In condition it shall be cool and sweet, but may be slightly soft or damp.

Rule 12.—Ungraded grain sold to arrive, or for future delivery, other than on sample or certificate, must be delivered in prime order (unless otherwise specified at time of sale), and be up to the average of the grade sold as known on this market.

Rule 13.—Ungraded grain sold to arrive on sample must be delivered in prime condition (unless otherwise specified at time of sale). Any slight inferiority in quality to sample shall not vitiate the sale, but such difference shall be settled by arbitration. When specified loads are sold, a loss of cargo or rejection for cause shall cancel the sale.

Rule 14.—When ungraded grain is sold on certificate of inspection of the port from which the grain is shipped, it shall be delivered in prime condition (unless otherwise specified at the time of sale), and such certificate shall be received as evidence of the grade. If such grain shall be transferred in transit, the seller must prove that the grain tendered is that covered by the certificate.

Rule 15.—On sales of ungraded grain to arrive, if tendered for delivery before 3 P.M., the day of tender and the two following working days, without regard to weather (ending at 6 P.M. of last-day), shall be deemed buyer's lay-days without charge.

Rule 16.—On time contracts made between members where grain is bought at buyer's option time of delivery shall be as follows. When the call is made by the buyer before 12 o'clock midday, the property shall be due and deliverable before 2-30 P.M. of the same day. When the call is made after 12 o'clock midday, the property shall be due and deliverable before 12-30 P.M. of the following business day; or the buyer may specify any particular future day during the term of the option upon which the property shall be due and deliverable, and the

property shall be due at 12-30 P.M. on the day designated (but no call shall be made before the beginning of the option); and if no call is made, the property shall be deliverable before 2-30 P.M. on the day of maturity of contract.

Rule 17.—Deliveries on contracts for 5,000 bushels of graded grain, or any multiple thereof, shall be made in lots of 5,000 bushels, and on contracts for one or more boat-loads, in lots of 8,000 bushels (except for oats, which shall be 10,000 bushels)—all within five per cent. more or less; excess or deficiency to be settled for at the market price of the day of delivery, and all deliveries on such contracts shall be free of towage to the buyer.

Rule 18.—Deliveries of railroad certificates of graded grain on time contracts may be made up to 2 P.M., provided that four days are allowed the buyer; otherwise seller must give written notice before 12-30 P.M. of his intention to deliver, and such notice may be passed to subsequent buyers up to 2-30 P.M., provided that no one shall hold such notice over fifteen minutes—the time of delivery to each party; and the contract price to be specified on the notice. When a contract shall mature on Sunday or a legal holiday, delivery on such contract shall be made on the preceding business day. No property shall be tendered on any day upon which the Produce Exchange does not hold a business session.

Rule 19.—On contracts for grain, the tender of a higher grade of the same kind of grain than the one contracted for shall be deemed sufficient; provided the higher grade of grain tendered shall not be of a colour or quality that will depreciate the value of the other, if mixed with it. Sellers of grain shall have the right to deliver in the customary manner afloat any grain in the port, provided the same shall grade in accordance with the contract on which the delivery is to be made, subject to the following conditions. When grain afloat is tendered, the inspector shall inspect the grain on the boat, and also superintend the actual delivery of the same. When grain tendered is in store, the inspector shall inspect the grain in store, and also superintend the delivery of the same from store into lighter or vessel. The Inspector-in-Chief shall give a certificate of such inspection, which certificate shall be valid, the same as with graded grain arriving by rail-road.

Rule 20, *section* 1.—In case any property contracted for future delivery is not delivered at maturity of contract, the purchaser may, at his option, consider the contract forfeited, or he may purchase the property on the market for account of the seller by 1-30 P.M. of the next business day (provided he shall have made a written demand for the delivery thereof), notifying him promptly of such purchase. Any loss resulting to the buyer shall be paid by the party in default.

Section 2.—In case any property contracted for delivery is not received and paid for when properly tendered, it shall be the duty of the seller, in order to establish any claim on the purchaser, to sell it on the market at any time during the next 24 hours, at his discretion, after such default shall have been made, notifying the purchaser within one hour of such sale, and any loss resulting to the seller shall be paid by the party in default.

Section 3.—Sections 1 and 2 of this rule shall not be construed as authorising unjust or unreasonable claims, based upon manipulated or fictitious markets; and in case of any disagreement arising from any action taken under this rule, the expressed willingness of either party to the controversy to submit the question of difference to arbitration shall be evidence on the part of such member of his readiness to equitably adjust and settle his said disputed obligation; and pending such proffered arbitration, if he shall abide by the same in good faith, he shall not be deemed guilty of an infraction of these rules.

Rule 21.—Any holder of a railroad certificate of graded grain who shall be dissatisfied with the quality of any lot tendered may call for a re-inspection, subject to appeal to the Committee on Grain. If the decision of the inspector shall be sustained, the cost of re-inspection shall be borne by the holder of the certificate; but if not sustained, by reason of error on the part of the inspector, he shall be held liable for damage occasioned thereby.

Rule 22.—On all sales or purchases of grain to arrive, or for future delivery, either party to the contract shall have the right to call an original margin of 10 cents per bushel on wheat, rye and barley, and 5 cents per bushel on corn and oats, and a further margin from time to time to the extent of any variation in the market value from the contract price; said margin to be deposited in such bank or trust company as may have been designated by the Finance Committee of the Produce Exchange, provided that such bank or trust company shall not be expressly objected to at the time of making the call. In case of such objection, then the deposit to be made in some duly authorised bank or trust company not objected to. When margins are called before 3 P.M., they must be deposited before 12 o'clock midday the following day. In case of failure to deposit as above, then the party calling the margin shall have the right to cover his or their contract at discretion, for account of the party failing to respond to the call for margin. When margins are called (original or for variations in the markets), certified cheques must be drawn to the order of the bank or trust company in which they are to be deposited, and sent to the Superintendent of the Exchange, who shall deposit the same and receive a certificate of deposit, made payable on the order of the Superintendent of the Exchange, and to the order of the buyer and seller. The Superintendent shall promptly send such certificate to the party making the deposit, and a copy of the same to the party calling the margin. In settlement the Superintendent shall endorse the amount due on the certificate over his own signature, as instructed by both parties to the contract. In case the two parties do not agree as to the amount due on the margin certificate, the same shall be submitted to arbitration for final adjustment. In case of the absence of the Superintendent, the President of the Produce Exchange or the Chairman of the Finance Committee shall act in his stead under this rule. This rule shall be governed in its privileges and restrictions by Rule 20.

Rule 23.—All grain sold by any member of the Produce Exchange shall be weighed or measured by a disinterested party, whose authority as such weigher or measurer shall be conferred or revoked by the

Committee on Grain; and all returns of weights and measures shall be promptly delivered to the owner of such grain, and the title shall not be deemed as passed until such returns are endorsed by the owner to the buyer.

Rule 24.—On all deliveries of grain afloat, sellers shall incur the customary expense of half-weighing. Where grain is measured or discharged other than by elevators, and any increased expense is thereby incurred, the buyers of such grain shall incur all additional expenses beyond the customary half-weighing as charged by elevators. Buyers shall pay any additional expense of harbour-towing in excess of the customary towing as agreed upon by the Joint Committee of Grain Merchants, Transportation Agents and Tow-boatmen.

Rule 25.—Any party feeling himself aggrieved by the decision of the Committee on Grain in the interpretation of these rules shall have the right of appeal to the Board of Managers of the Produce Exchange; and no change shall be made in these rules by the Committee on Grain before submitting the same to a meeting of the Grain Trade properly called, at which twenty shall constitute a quorum."

"*Articles of Agreement between the New York Produce Exchange and the New York Central and Hudson River Railroad Company, Erie Railway Company and Pennsylvania Railroad Company, relating to the inspection, grading, consolidation and delivery of grain arriving by rail at the port of New York.*

First.—In order to facilitate deliveries of grain arriving by rail at the port of New York, it is hereby mutually agreed by and between the parties hereto, in consideration of the adoption and enforcement of the following rules by the said parties respectively, in the manner and to the extent hereinafter set forth, and also for other good and valuable considerations, as follows.

Second.—The Railroad Companies, parties hereto, may put together in warehouses, boats or other receptacles provided by themselves for that purpose grain of the same kind and grade, without regard to ownership, after the same has been inspected, graded and weighed in accordance with the rules of the Produce Exchange as hereinafter set forth; but nothing herein contained shall be construed as depriving shippers of the right of preserving the identity of grain consigned to this market, if they shall so elect, subject only to such uniform conditions as may be made by the Railroad Companies hereto for that purpose.

Third.—It is hereby further agreed that all questions of difference between the New York Produce Exchange, or any member thereof, and the Railroad Companies, or either of them, growing out of the inspection and delivery of grain, shall be settled by a private arbitration committee, consisting of three persons, one of whom shall be selected by the President of the New York Produce Exchange, subject to the approval of the Committee on Grain, one by the Railroad Companies, or the company with which the controversy may arise, and these two to select a third; and the decision of a majority of such arbitration committee shall be final as to the case presented.

Fourth.—Any of the parties to this agreement desiring any alteration of, or amendment to any of, the following rules may give notice in writing to each of the other parties hereto, which notice shall contain the substance of the proposed alteration of amendment, and shall designate the time and place (in the city of New York) for a meeting of the said parties to consider and act on the same, and which time shall be at least thirty days subsequent to the date of the said notice.

Fifth.—The New York Produce Exchange agrees to adopt and enforce, as far as it legally may, the following rules, to be known as 'Rules of the New York Produce Exchange for Grading Grain':—

Rule 1.—The Committee on Grain of the Produce Exchange shall, upon the execution of this agreement, proceed to establish grades of all kinds of grain, and shall prepare and keep at the Produce Exchange standard samples of such grades; and for the proper maintenance of the grades of grain, as established under the provisions of this rule, the Committee on Grain shall appoint an Inspector-in-Chief, whose term of office and those of his appointees shall be subject to the pleasure of the said Committee, and who shall perform the duties as set forth in the following rules. The Committee on Grain shall also do such other proper and needful things as shall from time to time be required for properly carrying out this system of grading grain.

Rule 2.—The Inspector-in-Chief shall appoint such number of deputies as, in his opinion or in the opinion of the Committee on Grain, shall be sufficient to ensure the prompt and reliable inspection of each car of grain upon its arrival at the Hudson River terminus of the railroads, and the performance of such other duties as may devolve upon him or them under these rules. The salaries or fees of these deputies shall be paid by the Inspector-in-Chief.

Rule 3.—Immediately after their appointment, and before performing any of the duties of their office, the Inspector-in-Chief and his deputies shall be required to take or subscribe to the following oath or affirmation:—

'I do solemnly swear (or affirm, as the case may be) that I will execute the duties of an Inspector of Grain under the Rules of the New York Produce Exchange with strict impartiality and according to the best of my ability.'

Rule 4.—It shall be the duty of the Inspector-in-Chief or his deputies to inspect and determine the grades of grain (subject to inspection) in the cars; to supervise the weighing of the cars, loaded and light, upon the railroad track scales; and to see that such scales are in correct working order when in use. He shall keep, or cause to be kept, in a book or books provided by him for that purpose, an accurate record of the number of each car, the kind, grade and quantity of grain inspected and weighed therein, the date of such inspection and the name of the consignee. He shall also furnish to the Railroad Companies returns in duplicate of grain so inspected and weighed at the Hudson River termini of their respective lines, which returns shall be made upon the following form of inspector's return. [The form is given above.]

Rule 5.—The compensation for inspection shall be at a rate per car to be determined and regulated by the Committee on Grain, and shall be payable weekly by the consignees to the Inspector-in-Chief.

Rule 6.—On all scales of graded grain, the tender of guaranteed certificates, as described in Rule 1 of the Rules of the Railroad Companies, shall constitute a delivery of the grain as between sellers and buyers. except in the cases provided in Rules 7 and 9 of the Railroad Companies, when such certificates shall cease to be a valid delivery as between sellers and buyers. Such deliveries shall be made between the hours of 10 A.M. and 2 P.M. Deliveries shall be known as regular when three working days, including the day of tender, are allowed by sellers. When the term 'fresh' is used, it shall be understood to mean four days, as above. Sellers shall deduct from their invoices the customary half-weighing, elevation or cost of delivery of grain from boats, any accrued demurrage, and also if necessary sufficient unaccrued demurrage, to give buyers 'regular' time for delivery, as hereinbefore described, which charges shall then be assumed by buyers.

Rule 7.—Inspectors shall furnish samples of grain inspected on arrival as out of condition or unmerchantable, or for which no grades are established, before noon on the day such grain is ready for delivery.

Rule 8.—All grain delivered under these rules shall be weighed or measured, as provided in Rule 23 of the "Rules regulating the grain trade in the City of New York," and the weigher or measurer shall promptly furnish to the Railroad Company from whose boat or boats such delivery shall be made a true and correct return of the weight (in bushels and pounds) of each lot of grain so delivered, upon the following form of certificate:—

*To the*_____*R. R. Co.*

This is to certify that I have weighed (or measured) from boat

_____for account of

_____

_____bushels of_____

and that the same has this day been delivered to_____

Boat ready for delivery_____

Delivery completed_____

(*Signed*)_____

Weigher.

*New York,*_____

The representatives of each Railroad Company shall have the right to verify the correctness of such certificate of grain delivered from its boats by examination of the weigher's books or scales, or both, either during or after such delivery.

If any weigher or measurer shall refuse to permit such examination and verifications, or shall unreasonably impede the same, the party aggrieved may make complaint to the Committee on Grain of the New York Produce Exchange, and if, after investigation by the said Committee, such complaint be deemed substantiated, the license of such weigher or measurer shall be revoked.

Rule 9.—Any grievances between members growing out of the inspection of grain shall be referred to the Committee on Grain of the New York Produce Exchange for adjudication.

Sixth.—The ——————————Railroad Companies, parties hereto, agree that they will, for the purpose of carrying out this agreement, adopt and enforce, as far as they legally may, the following rules, to be known as 'Rules of the Railroad Companies for Graded Grain at the port of New York':—

Rule 1.—The Railroad Companies, parties hereto, will severally issue guaranteed certificates for grain consigned to New York, when consolidated and graded under the provisions of this agreement (in the form given on page 3).

The quantity of grain represented by each certificate shall not exceed 8,000 bushels, except of oats, for which the certificates shall not exceed 10,000 bushels each. These certificates shall be properly dated and numbered consecutively, and shall state and detail the kind, grade and quantity of the grain represented by them, and shall be furnished to the consignees before noon of the dates thereof, accompanied by the freight bills and inspection returns. The Railroad Companies shall, however, have the right to withhold such certificates until the freight (computed upon the track scale weights as verified by the inspector) and all accrued charges upon the grain represented by such certificates shall have been paid.

Rule. 2.—Consignees shall be allowed to hold grain in boats four days (exclusive of Sundays and legal holidays), including the dates of the certificates, free of expense. After that time demurrage shall accrue at one-eight of one cent per bushel per day, or part thereof, whether orders for delivery have been given or not, which charge shall then continue until the demurrage charge accrues, as provided in Rule 5.

Rule 3.—Upon surrender of certificates to the Railroad Company issuing the same with an order directing delivery of the grain, the said Company shall give proper receipts for the said certificates, and shall promptly deliver the grade and quantity of the grain specified therein at any customary place of delivery in the port of New York, as directed.

Rule 4.—The Railroad Companies shall not be required to place, free of towage, less than 4,000 bushels of one grade or kind of grain at any one point in the harbour.

Rule 5.—After grain is ordered, consignees or owners shall be allowed three days, at the rate of demurrage provided in Rule 2 (exclusive of Sundays and legal holidays), including that of its arrival at the specified point of destination, for unloading, and shall thereafter pay 10 dollars demurrage for each 24 hours, or parts thereof, on each

order for the delivery of 10,000 bushels or less of one grade of oats, or 8,000 bushels or less of one grade of any other kind of grain, until the same be discharged, whether such time be within the original four days or not; but the Railroad Companies shall have the right to terminate their liability in the manner provided in Rule 7.

Rule 6.—The Railroad Companies shall be liable as common carriers for the safety of grain represented by their certificates until delivered in accordance with these rules; but they shall have the right to terminate their liability in the manner provided in Rule 7.

Rule 7.—If any certificate of graded grain be not surrendered to the Railroad Company issuing the same within five days from and including the date thereof with an order directing the delivery of the grain, the said Company may thereafter give not less than 48 hours' notice on the Bulletin of the New York Produce Exchange of their intention to store in grain warehouses the grain represented by such certificate; and if such certificate be not surrendered within the time specified in such notice, with an order directing some other disposition of the property, the said Company may thereafter so store the grain at the expense and risk of the owner thereof. Upon the surrender of the certificate for grain so stored, and the payment of the accrued charges, the Railroad Company shall furnish a customary warehouse receipt in exchange therefor, and thereupon the liability of the said Company under such guaranteed certificate shall terminate.

Rule 8.—All grain for which no grades are established shall be kept separate and delivered from track, or under such uniform conditions as may be made by the Railroad Companies, parties hereto, for that purpose.

Rule 9.—The Railroad Companies, parties hereto, shall require their employés in charge of grain held afloat under these rules to exercise care and watchfulness respecting the condition of such grain, and to give notice to the Inspector-in-Chief without unnecessary delay of any change discovered by them in the condition of grain in their charge. Also to give to the Inspector-in-Chief, or his deputies, at all times, every reasonable facility for the thorough examination of grain, whether any report of its condition has been made by them or not.

It shall be the duty of the Inspector-in-Chief from time to time to cause examination to be made of the condition of grain in boats for which guaranteed certificates have been issued; and if any of such grain shall be found to be out of condition, he shall promptly give notice of the fact to the Railroad Company having such grain in its possession, and shall state in such notice the kind and grade of grain, and as near as practicable its actual condition; also the name and location of the boat or boats containing the same. Whereupon the Railroad Company receiving such notice shall, without unnecessary delay, certify thereon the certificates outstanding upon which such grain will be delivered, which certificates shall be those of the oldest numbers and dates then in circulation or uncancelled; also the quantity to be delivered under such certificates, and cause such notice to be posted upon the Bulletin of the Produce Exchange, and thereafter the certificates so posted shall cease to be a valid delivery of graded grain under these

rules, as between sellers and buyers. Such posted grain shall be delivered, subject to any extra expense for re-inspection, if the same shall have been tendered for delivery and rejected for cause by the owner of the certificate upon which it had been tendered."

"*Grades of Grain established by the Committee on Grain of the New York Produce Exchange.*

Winter wheat.—Extra white winter wheat shall be bright, sound, dry, plump, well cleaned and pure white.

No. 1 white winter wheat shall be sound, dry, reasonably clean, nearly pure white, weighing not less than 59lbs. to the measured bushel.

No. 2 white winter wheat shall consist of all sound white winter wheat unfit to grade No. 1.

Amber winter wheat shall be bright, sound, dry, plump, well cleaned and pure amber.

No. 1 red winter wheat shall be sound, dry, plump and well cleaned.

No. 2 red winter wheat shall be sound, dry, reasonably clean, weighing not less than 57lbs. to the measured bushel.

No. 3 red winter wheat shall include wheat fit for warehousing, otherwise unfit to grade No. 2.

No-grade winter wheat shall include all winter wheat unfit to grade No. 3 red.

Spring wheat.—No. 1 hard spring wheat shall be sound, plump and well cleaned, weighing not less than 59lbs. to the measured bushel, and composed mostly of the hard varieties of spring wheat.

No. 1 north-west spring wheat shall be sound, well cleaned, weighing not less than 58lbs. to the measured bushel.

No. 2 north-west spring wheat shall be sound, reasonably clean, weighing not less than 56lbs. to the measured bushel.

No. 3 north-west spring wheat shall be sound, reasonably clean, weighing not less than 54lbs. to the measured bushel.

[*Note.*—The grades of north-west wheat are to include the light-coloured, plump wheats, such as are grown in the north-west, and to correspond, as far as practicable, in colour and general character with the Milwaukee and Duluth grades.]

No. 1 spring wheat shall be sound, well cleaned, weighing not less than 57½lbs. to the measured bushel.

No. 2 spring wheat shall be sound, reasonably clean, weighing not less than 55lbs. to the measured bushel.

No. 3 spring wheat shall be sound, reasonably clean, weighing not less than 53lbs. to the measured bushel.

[*Note.*—These three grades are to include wheats darker in colour and not as plump in berry as the north-west grades, but which conform to the character of Chicago grades as known in this market.]

Steamer spring wheat.—In case of wheat which shall be equal in all respects as to the quality to the above grades, but which shall be slightly soft or damp, the word 'steamer' shall be prefixed.

Rejected spring wheat shall include all merchantable spring wheat unfit for No. 3, weighing not less than 51½lbs. to the measured bushel.

No-grade spring wheat shall comprise merchantable wheat for any cause unfit to grade as rejected.

Corn.—White corn shall be sound, dry, plump and well cleaned; an occasional coloured grain shall not deprive it of this grade.

Yellow corn shall be sound, dry, plump and well cleaned; an occasional white or red grain shall not deprive it of this grade.

Mixed corn shall be sound, dry and reasonably clean.

Low mixed corn shall be sound, dry, reasonably clean, but in colour unsuitable to grade mixed corn.

Steamer corn shall include corn of the above-named grades in quality; in condition it may be slightly soft or damp, but must be cool.

[*Note.*—The steamer grades are steamer white, steamer yellow, and steamer mixed, there being no grade of steamer low mixed corn.]

No-grade corn.—All soft, damp corn, or corn inferior in quality to that described as steamer corn, shall be called 'no grade.'

Oats.—No. 1 white oats shall be bright, sound, reasonably clean and free from other grain, and shall weigh not less than 32lbs. to the measured bushel.

No. 2 white oats shall be seven-eights white and equal to No. 2 oats in all other respects.

No. 1 oats shall be bright, sound, reasonably clean and free from other grain, and shall weigh not less than 32lbs. to the measured bushel.

No. 2 oats shall be reasonably sound, reasonably clean and reasonably free from other grain.

Rejected oats.—All merchantable oats, damp, unsound, dirty, or for any other cause unfit for No. 2, shall be graded as rejected.

Rye.—No. 1 rye shall be sound, plump and well cleaned.

No. 2 rye shall be sound, reasonably clean and reasonably free from other grain.

No-grade rye shall include all damp, musty or dirty rye, or which for any cause may be unfit to grade as No. 2.

Barley.—Extra Canada barley shall be of a bright natural colour, plump, sound and well cleaned, weighing not less than 48lbs. to the measured bushel.

No. 1 Canada barley shall be plump, sound and well cleaned, weighing not less than 48lbs. to the measured bushel, but in colour not equal to 'extra.'

No. 2 Canada barley shall be plump, sound, reasonably clean, but may be stained.

No. 3 Canada barley shall be sound, reasonably clean, fit for malting; otherwise unfit for No. 2.

No. 1 State barley, four-rowed, shall be of a bright natural colour, plump, sound and well cleaned, weighing not less than 48lbs. to the measured bushel.

No. 2 State barley, four-rowed, shall be plump, sound, reasonably clean, but may be slightly stained.

No. 3 State barley, four-rowed, shall be sound, reasonably clean, fit for malting; otherwise unfit for No. 2.

No. 1 State barley, two-rowed, shall be of a bright natural colour, plump, sound and well cleaned.

No. 2 State barley, two-rowed, shall be sound, reasonably clean and fit for malting purposes, but may be stained.

No-grade barley shall be such as is, for any reason, unfit for No. 2 of two-rowed, or of No. 3 of other grades.

Peas.—No. 1 white Canada peas shall be bright, sound, plump, well cleaned and free from bugs, but may have a slight admixture of grey or green peas.

No. 2 white Canada peas shall be bright, sound, reasonably clean and reasonably free from bugs, and may admit of a greater admixture of grey, green and dead peas than the grade No. 1.

No. 3 white Canada peas shall include all peas inferior to the grade of No. 2."

Chicago Laws.

The following are the rules concerning the inspection of grain in the city of Chicago :—

"The following are the rules adopted by the Board of Railroad and Warehouse Commissioners, establishing a proper number and standard of grades for the inspection of grain :

Rule I.

Winter wheat.—No. 1 white winter wheat shall be pure white winter wheat, sound, plump and well cleaned.

No. 2 white winter wheat shall be pure white winter wheat, sound and reasonably clean.

No. 1 red winter wheat shall be pure winter wheat, red, or red and white mixed, sound, plump and well cleaned.

No. 2 red winter wheat shall be pure winter wheat, red, or red and white mixed, sound and reasonably clean.

Amber wheat, Nos. 1 and 2, shall include the lighter-coloured varieties of red wheat; quality and condition to be equal to the present standard of Nos. 1 and 2 red winter wheat.

No. 3 winter wheat shall include winter wheat not clean and plump enough for No. 2, and weighing not less than 54lbs. to the measured bushel.

Rejected winter wheat shall include winter wheat, damp, musty, or from any cause so badly damaged as to render it unfit for No. 3.

Rule II.

Spring wheat.—No. 1 spring wheat shall be sound, plump and well cleaned.

No. 2 spring wheat shall be sound, reasonably clean and of good milling quality.

North-western spring wheat, Nos. 1 and 2, shall include the varieties of hard spring wheat of good milling quality, and equal in every respect to the present standard of Nos. 1 and 2 spring wheat.

No. 3 spring wheat shall include all inferior, shrunken or dirty spring wheat, weighing not less than 53lbs. to the measured bushel.

Rejected spring wheat shall include spring wheat, damp, musty, grown, badly bleached or for any other cause which renders it unfit for No. 3.

In case of mixture of spring and winter wheat, it will be called 'spring wheat' and graded according to the quality thereof.

Black Sea and Flinty Fife wheat shall in no case be inspected higher than No. 2, and rice wheat no higher than rejected.

Rule III.

Corn.—No. 1 yellow corn shall be yellow, sound, dry, plump and well cleaned.

No. 1 white corn shall be white, sound, dry, plump and well cleaned.

No. 1 corn shall be sound, dry, plump and well cleaned, white and yellow unmixed with red.

High mixed corn shall be three-quarters yellow, and equal to No. 2 in condition and quality.

No. 2 corn shall be dry, reasonably clean, but not plump enough for No. 1.

No. 2 kiln-dried corn shall be sound, plump and well cleaned, white or yellow. All kiln-dried corn, not good enough for No. 2 kiln-dried, shall be graded as rejected kiln-dried corn.

New high mixed corn shall be three-fourths yellow, of any age, reasonably dry and reasonably clean, but not sufficiently dry for high mixed or No. 2.

New mixed corn may be less than three-fourths yellow, of any age, and shall be reasonably dry and reasonably clean, but not sufficiently dry for No. 2.

Rejected.—All damp, dirty or otherwise badly damaged corn shall be graded as rejected.

Rule IV.

Oats.—No. 1 oats shall be white, sound, clean and reasonably free from other grain.

No. 2 white oats shall be three-quarters white and equal to No. 2 in all other respects.

No. 2 oats shall be sound, reasonably clean and reasonably free from other grain.

Rejected.—All oats damp, unsound, dirty or for any other cause unfit for No. 2 shall be graded as rejected.

Rule V.

Rye.—No. 1 rye shall be sound, plump and well cleaned.

No. 2 rye shall be sound, reasonably clean and reasonably free from other grain.

Rejected.—All rye damp, musty, dirty or from any cause unfit for No. 2 shall be graded as rejected.

Rule VI.

Barley.—No. 1 barley shall be plump, bright sound, clean, and free from other grain.

No. 2 barley shall be sound, bright, not plump enough for No. 1, reasonably clean and reasonably free from other grain.

No. 3 barley shall include shrunken or otherwise slightly damaged barley, weighing not less than 41lbs. to the measured bushel.

Rejected.—All barley which is damp, musty or from any cause is badly damaged, or largely mixed with other grain, shall be graded as rejected.

Rule VII.

The word 'new' shall be inserted in each certificate of inspection of a newly-harvested crop of oats until the fifteenth day of August; of rye until the first day of September; of wheat until the first day of November; and of barley until the first day of May of each year. This change shall be construed as establishing a new grade for the time specified, to conform in every particular to the existing grades of grain, excepting the distinctions of 'new' and 'old.'

Rule VIII.

All grain that is warm, or is in a heating condition, or is otherwise unfit for warehousing, shall not be graded.

Rule IX.

All inspectors shall make their reasons for grading grain, when necessary, fully known by notations on their books. The weight alone shall not determine the grade.

Rule X.

Each inspector is required to ascertain the weight per measured bushel of each lot of wheat inspected by him, and note the same in his book.

Any duly authorised inspector of grain who shall be guilty of neglect of duty, or who shall knowingly or carelessly inspect or grade any grain improperly, or who shall accept any money or other consideration, directly or indirectly, for any neglect of duty or the improper performance of any duty as inspector of grain, and any person who shall improperly influence any inspector of grain in the performance of his duties as such inspector, shall be deemed guilty of a misdemeanour, and be liable on conviction to fine or imprisonment, or both.

The chief inspector, and all persons inspecting grain under his direction, shall in no case make the grade of grain above that of the poorest quality found in any lot of grain when it has evidently been mixed or doctored for the purpose of deception.

The said chief inspector is hereby authorised to collect, until further notice, on all grain inspected under his direction as follows:—

For in-inspection—25 cents per cart-load, 10 cents per wagon or cart-load, 40 cents per 1,000 bushels from canal boats, one-fourth of 1 cent per bushel from bags.

For out-inspection—40 cents per 1,000 bushels to vessels, 30 cents per car-load to cars, 30 cents per car-load to teams, or 10 cents per wagon-load to teams."

Illinois Laws.

The laws of Illinois relating to the inspection, delivery, grading, &c., of grain, are contained in Acts of the State Legislature, of the principal provisions of which the following paragraphs are a summary :—

"Public warehouses divided into three classes, to be designated (*a*), (*b*) and (*c*), respectively.

Public warehouses of class (*a*) embrace all warehouses, elevators or granaries in which grain is stored in bulk, and in which the grain of different owners is mixed together, or in which grain is stored in such a manner that the identity of different lots or parcels cannot be accurately preserved, such warehouses, elevators or granaries being located in cities having not less than 100,000 inhabitants. Public warehouses of class (*b*) embrace all other warehouses, elevators or granaries in which grain is stored in bulk, and in which the grain of different owners is mixed together. Public warehouses of class (*c*) embrace all other warehouses or places where property of any kind is stored for a consideration.

Warehouses shall be licensed, and that the person obtaining a license shall enter into a security bond for due performance of his duty as a public warehouseman.

It is the duty of every warehouseman of class (*a*) to receive for storage any grain that may be tendered to him in the usual manner in which warehouses are accustomed to receive the same in the ordinary and usual course of business, not making any discrimination between persons desiring to avail themselves of warehouse facilities; such grain, in all cases, to be inspected and graded by a duly authorised inspector, and to be stored with grain of a similar grade, received at the same time, as near as may be. In no case is grain of different grades to be mixed together while in store; but if the owner or consignee so requests, and the warehouseman consents thereto, his grain of the same grade may be kept in a bin by itself, apart from that of other owners, which bin shall thereupon be marked and known as a separate bin. If a warehouse receipt be issued for grain so kept separate, it shall state on its face that it is in a separate bin, and shall state the number of such bin; and no grain shall be delivered from such warehouses unless it be inspected on the delivery thereof by a duly authorised inspector of grain.

Upon application of the owner or consignee of grain stored in a public warhouse of class (*a*), the same being accompanied with evidence that all transportation or other charges which may be a lien upon such grain, including charges for inspection, have been paid, the warehouseman shall issue to the person entitled thereto a warehouse receipt therefor, subject to the order of the owner or consignee, which receipt shall bear date corresponding with the receipt of the grain into store, and shall state upon its face the quantity and inspected grade of the grain, and that the grain mentioned in it has been received into store, to be stored with grain of the same grade by inspection received at about the date of the receipt, and that it is deliverable upon the return of the receipt properly endorsed by the person to whose order it was issued and the payment of proper charges for storage. All warehouse receipts for grain issued from the same warehouse shall be consecutively numbered, and no two receipts bearing the same number shall be issued from the same

warehouse during any one year, except in the case of a lost or destroyed receipt, in which case the new receipt shall bear the same date and number as the original, and shall be plainly marked on its face 'duplicate.' If the grain was received from railroad cars, the number of each car shall be stated upon the receipt, with the amount it contained: if from canal boat or other vessel, the name of such craft: if from teams or by other means, the manner of its receipt shall be stated on its face.

Upon the delivery of grain from store upon any receipt, such receipt shall be plainly marked across its face with the word 'cancelled,' with the name of the person cancelling the same, and shall thereafter be void, and shall not again be put in circulation; nor shall grain be delivered twice upon the same receipt.

No warehouse receipt shall be issued, except upon the actual delivery of grain into store in the warehouse from which it purports to be issued, and which is to be represented by the receipt; nor shall any receipt be issued for a greater quantity of grain than was contained in the lot or parcel stated to have been received, nor shall more than one receipt be issued for the same lot of grain, except in cases where receipts for a part of a lot are desired, and then the aggregate receipts for a particular lot shall cover that lot, and no more. In cases where a part of the grain represented by the receipt is delivered out of store and the remainder is left, a new receipt may be issued for such remainder; but such new receipt shall bear the same date as the original, and shall state on its face that it is the balance of receipt of the original number, and the receipt upon which a part has been delivered shall be cancelled in the same manner as if it had all been delivered. In case it be desirable to divide one receipt into two or more, or in case it be desirable to consolidate two or more receipts into one, and the warehouseman consents thereto, the original receipts shall be cancelled the same as if the grain had been delivered from store, and the new receipts shall express on their face that they are parts of other receipts, or a consolidation of other receipts, as the case may be; and the numbers of the original receipts shall also appear upon the new ones issued, as explanatory of the change, but no consolidation of receipts of dates differing more than ten days shall be permitted, and all new receipts issued for old ones cancelled, as herein provided, shall bear the same dates as those originally issued, as near as may be.

On the return of any warehouse receipt issued by him properly endorsed, and the tender of all proper charges upon the property represented by it, such property shall be immediately deliverable to the holder of such receipt, and it shall not be subject to any further charges for storage after demand for such delivery shall have been made. Unless the property represented by such receipt shall be delivered within two business hours after such demand shall have been made, the warehouseman in default shall be liable to the owner of such receipt for damages for such default in the sum of one cent per bushel, and in addition thereto one cent per bushel for each and every day of such neglect or refusal to deliver, provided no warehouseman shall be held to be in default in delivering if the property is delivered in the order demanded, and as rapidly as due diligence, care and prudence will justify.

The warehouseman of every public warehouse of class (*a*) shall, on or before Tuesday morning of each week, cause to be made out, and shall keep posted up in the business-office of his warehouse, in a conspicuous place, a statement of the amount of each kind and grade of grain in store in his warehouse at the close of business on the previous Saturday; and shall also, on each Tuesday morning, render a similar statement, made under oath, by one of the principal owners or operators thereof, or by the book-keeper thereof, having personal knowledge of the facts, to the warehouse registrar.

They shall also be required to furnish daily to the said registrar a correct statement of the amount of each kind and grade of grain received in store in such warehouse on the previous day; also the amount of each kind and grade of grain delivered or shipped by such warehouseman during the previous day, and what warehouse receipts have been cancelled upon which the grain has been delivered on such day, giving the number of each receipt, amount, kind and grade of grain received and shipped upon each; also how much grain, if any, was so delivered or shipped, and the kind and grade of it, for which warehouse receipts had not been issued, and when and how such unreceipted grain was received by them, the aggregate of such reported cancellations and delivery of unreceipted grain, corresponding in amount, kind and grade with the amount so reported delivered or shipped.

They shall also at the same time report what receipts, if any, have been cancelled and new ones issued in their stead, as herein provided for. And the warehouseman making such statements shall, in addition, furnish the said registrar any further information regarding receipts issued or cancelled that may be necessary to enable him to keep a full and correct record of all receipts issued and cancelled, and of grain received and delivered.

Grain that is warm, or is in a heating condition, shall not be graded. In the inspection of grain, the weight shall not alone determine the grade. All inspectors shall make their reasons for grading grain, when necessary, fully known by notations on their books. All wheat shall be weighed, and the weight entered on the inspection book.

A chief inspector of grain to be appointed by the Governor of the State, the office being tenable for two years, for every city in which is located a warehouse of class (*a*). Such chief inspector to have a general supervision of the inspection of grain, under the advice and immediate direction of the Board of Commissioners of Railroads and Warehouses.

The chief inspector to nominate to the Commissioners of Railroads and Warehouses suitable persons in sufficient numbers qualified for assistant inspectors, and also such other employés as may be necessary to properly conduct the business of his office; and authorises the Commissioners to make such appointments.

The chief inspector to be sworn before entering upon the duties of his office, and to execute a bond in the penal sum of $50,000, with approved sureties, that he will faithfully and strictly discharge the duties of his said office of inspector according to law and the rules and regulations prescribing his duties; and that he will pay all damages to any person or persons who may be injured by reason of his neglect, refusal

or failure to comply with law, and the rules and regulations aforesaid. Each assistant inspector to be also sworn and execute a bond in the penal sum of $5,000, with like conditions, and to be approved in like manner as is provided in case of the chief inspector.

The chief inspector of grain, and all assistant inspectors of grain, and other employés in connection therewith, are governed in the respective duties by such rules and regulations as may be prescribed by the Board of Commissioners of Railroads and Warehouses, which Board has full power to make all proper rules and regulations for the inspection of grain; and to fix the rate of charges for the inspection of grain, and the manner in which the same shall be collected. Such charges to be regulated in such a manner as will, in the judgment of the Commissioners, produce sufficient revenue to meet the necessary expenses of the service of inspection, and no more.

Every warehouseman of public warehouses of class (*a*) shall be required, during the first week in January of each year, to publish in one or more of the local newspapers (daily, if there be such) published in the city in which such warehouse is situated a table or schedule of rates for the storage of grain in his warehouse during the ensuing year, which rates shall not be increased during the year.

The maximum charge for storage and handling of grain, including the cost of receiving and delivering, shall be for the first thirty days or part thereof, two cents per bushel, and for each fifteen days or part thereof after the first thirty days, one-half of one cent per bushel. Grain which is damp or liable to early damage, as indicated by its inspection when received, may be subject to two cents per bushel storage for the first ten days, and for each additional five days or part thereof, not exceeding one-half of one cent per bushel.

No public warehouseman shall be held responsible for any loss or damage to property by fire while in his custody, provided reasonable care and vigilance be exercised to protect and preserve the same; nor shall he be held liable for damage to grain by heating, if it can be shown that he has exercised proper care in handling and storing the same, and that such heating or damage was the result of causes beyond his control; and, in order that no injustice may result to the holder of grain in any public warehouse of class (*a*) or (*b*), it shall be deemed the duty of such warehouseman to dispose of, by delivery or shipping in the ordinary and legal manner of so delivering, that grain of any particular grade which was first received by them or which has been for the longest time in store in his warehouse; and, unless public notice has been given that some portion of the grain in his warehouse is out of condition or becoming so, such warehouseman shall deliver grain of quality equal to that received by him on all receipts as presented.

In case, however, any warehouseman of class (*a*) or (*b*) shall discover that any portion of the grain in his warehouse is out of condition or becoming so, and it is not in his power to preserve the same, he shall immediately give public notice, by advertisement in a daily newspaper in the city in which such warehouse is situated, and by posting a notice in the most public place (for such a purpose) in such city, of its actual condition, as near as he can ascertain it; shall state in such notice the

kind and grade of the grain, and the bins in which it is stored; and shall also state in such notice the receipts outstanding upon which such grain will be delivered, giving the numbers, amounts and dates of each, which receipts shall be those of the oldest dates then in circulation or uncancelled, the grain represented by which has not previously been declared or receipted for as out of condition; or if the grain longest in store has not been receipted for, he shall so state, and shall give the name of the party for whom such grain was stored, the date it was received, and the amount of it; and the enumeration of receipts and identification of grain so discredited shall embrace, as near as may be, as great a quantity of grain as is contained in such bins, and such grain shall be delivered upon the return and cancellation of the receipts, and the unreceipted grain upon the request of the owner or person in charge thereof.

Nothing herein contained shall be held to relieve the said warehouseman from exercising proper care and vigilance in preserving such grain after such publication of its condition; but such grain shall be kept separate and apart from all direct contact with other grain, and shall not be mixed with other grain while in store in such warehouse.

A public warehouseman may not mix any grain of different grades together, or select different qualities of the same grade for the purpose of storing or delivering the same; nor shall he attempt to deliver grain of one grade for another, or in any way tamper with grain while in his possession or custody; and in no case, even of grain stored in a separate bin, shall he be permitted to mix grain of different grades together while in store. He may however, on request of the owner of any grain stored in a private bin, be permitted to dry, clean or otherwise improve the condition or value of any such lot of grain; but in such case it shall only be delivered as such separate lot, or as the grade it was originally (inspected) when received by him, without reference to the grade it may be as improved by such process of drying or cleaning.

All persons owning property, or who may be interested in the same, in any public warehouse, and all duly authorised inspectors of such property, shall at all times, during ordinary business hours, be at full liberty to examine any and all property stored in any public warehouse in this State, and all proper facilities shall be extended to such person by the warehouseman, his agents and servants for an examination; and all parts of public warehouses shall be free for the inspection and examination of any person interested in property stored therein, or of any authorised inspector of such property.

In all places where there are legally appointed inspectors of grain, no proprietor or manager of a public warehouse of class (*b*) shall be permitted to receive any grain and mix the same with the grain of other owners in the storage thereof, until the same shall have been inspected and graded by such inspector.

In case any owner or consignee of grain shall be dissatisfied with the inspection of any lot of grain, or shall from any cause desire to receive his property without its passing into store, he shall be at liberty to have the same withheld from going into any public warehouse (whether the

property may have previously been consigned to such warehouse or not), by giving notice to the person or corporation in whose possession it may be at the time of giving such notice. Such grain shall be delivered to him, subject only to such proper charges as may be a lien upon it prior to such notice.

The grain, if in railroad cars, to be removed therefrom by such owner or consignee within 24 hours after such notice has been given to the Railroad Company having it in possession, provided such Railroad Company place the same in a proper and convenient place for unloading. Notice that such grain is not to be delivered into store may also be given to the proprietor or manager of any warehouse into which it would otherwise have been delivered, and if, after such notice, it be taken into store in such warehouse, the proprietor or manager of such warehouse shall be liable to the owner of such grain for double its market value.

Warehouse receipts for property stored in any class of public warehouses are transferable by endorsement, which may be made either in blank or to the order of another. All warehouse receipts for property stored in public warehouses of class (*c*) shall distinctly state on their face the brand or distinguishing marks upon such property."

Milwaukee Rules.

The rules of the Milwaukee Chamber of Commerce for the grading and inspection of wheat are given below :—

"*Spring wheat.*—No. 1 spring wheat must be sound, well cleaned wheat, weighing not less than 58lbs. to the measured bushel.

Extra No. 1 spring shall be composed of plump, sound, well cleaned spring wheat, bright in colour, and weighing not less than 60lbs. to the measured bushel.

No. 1 hard spring wheat shall be composed mostly of hard Fife or Black Sea wheat, which must be sound, well cleaned, and weigh not less than 58lbs. to the measured bushel.

No. 2 spring wheat must be sound and reasonably clean and weigh not less than 56 lbs. to the measured bushel.

Rice wheat will in no case be inspected higher than rejected. In case of a mixture of spring and winter wheat, it will be called 'spring wheat' and graded according to quality thereof.

No. 3 spring wheat shall comprise all wheat fit for warehousing, weighing not less than 54lbs. to the measured bushel.

Rejected shall comprise all wheat fit for warehousing, but too low in weight, or otherwise unfit to pass as No. 3.

Winter wheat.—White winter must be choice white wheat, plump, sound and clean.

No. 1 winter.—Red, or red and white mixed clean and sound milling wheat.

No. 2 winter.—Sound winter wheat, but of inferior grade.

Rejected winter.—Merchantable winter wheat, inferior to No. 2.

Corn.—No. 1 corn must be plump, sound, dry and well cleaned.

No. 2 corn must be sound, dry and reasonably clean.

Rejected.—All corn fit for warehousing that from any cause falls below the standard of No. 2.

Oats.—No. 1 oats to be white, sound, free from other grain and reasonably well cleaned.

No. 2 oats to be sound and reasonably clean.

Rejected.—Oats damp, unsound, dirty or from any cause unfit for No. 2.

Rye.—No. 1 rye to be sound and well cleaned.

No. 2 rye to be sound and reasonably clean.

Rejected.—Rye unsound but fit for warehousing.

Barley.—No. 1 barley shall be of a bright natural colour, plump, sound, well cleaned and free from other grain.

No. 2 barley shall be sound and reasonably plump, reasonably clean and free from other grain—good malting barley, but may be slightly stained.

No. 3 barley shall include all shrunken, discoloured, but reasonably sound barley, and fit for malting purposes.

Rejected barley shall include all barley unsound or for any cause unfit for No. 3, but fit for warehousing.

Inspection fees.—The fees for inspecting grain under these rules shall be 15 cents per car-load, and for inspecting cargoes of grain out of the railroad elevators shall be 30 cents per thousand bushels, and out of all other elevators and warehouses 40 cents per thousand bushels.

Certificates of inspection.—It shall be the duty of the inspector to give a certificate as to the quality of the grain so inspected under the corporate seal of the Chamber of Commerce; the cost of inspection to be paid by the purchaser of the cargo inspected. No certificate of inspection shall be issued under the seal of the Chamber of Commerce, unless such certificate covers the entire cargo."

No. 235, dated Madras, the 14th February 1878.

From—C. G. MASTER, Esq., Secretary to the Government of Madras,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am directed to acknowledge the receipt of the Proceedings of the Government of India dated 24th August 1877, No. 3-189, forwarding a Summary of the Rules in force in the United States relating to the inspection and grading of wheat and other grains, and requesting local Governments and Chambers of Commerce to consider whether and similar system could be adopted in this country.

2. In reply, I am directed to forward the accompanying Proceedings of Government of this day's date, No. 234, embodying Proceedings of the Board of Revenue and letter from the Madras Chamber of Commerce on the subject, and to state that this Government consider with the Board that the proposed system is not likely to prove feasible in this Presidency.

Extract from the Proceedings of the Government of Madras in the Revenue Department,—No. 234, *dated the* 14*th February* 1878.

Read the following papers :—

Proceedings of the Board of Revenue, No. 4924, dated 5th November 1877.

Proceedings of the Madras Government, Revenue Department, No. 2828, dated 22nd September 1877.

Abstract.—Communicating to the Board of Revenue and Chamber of Commerce papers from the Government of India regarding the adoption of measures for improving the quality of Indian wheat, and requesting their views on certain points referred to.

Observations.—The Board do not consider that arrangements similar to those indicated in the papers communicated with the foregoing order are likely to prove feasible or suited to the customs of the mass of grain-dealers in this country, and they cannot suggest any measures for furthering the introduction of a system of inspection and grading of grain. As regards wheat, to which the proposal principally relates, the trade in that grain as shown in Board's Proceedings No. 2015, dated 1st May 1877, is too insignificant to render any measure of the sort necessary or desirable, so far as this presidency is concerned.

Dated Madras, the 1st February 1878.

From—A. MACKENZIE, Esq., Chairman to the Madras Chamber of Commerce,

To—The Secretary to the Government of Madras.

In reply to your memorandum of the 29th ultimo, I have the honour to inform you that native dealers in grain are not represented in the Chamber; and that as the members of the Chamber are not engaged in the grain trade in the interior, they can exercise no influence over dealers that could be brought to bear in favour of an alteration of the system of grading this class of produce.

Order thereon by the Government of Madras.

With their Proceedings No. 3-189, dated 24th August 1877, the Government of India forwarded a Summary of the Rules in force in the United States relating to the inspection and grading of wheat and other grains, and requested Local Governments and Chambers of Commerce to consider whether any similar system could be adopted in this country.

2. The papers above recorded, which contain the views of the Board of Revenue and of the Madras Chamber of Commerce on the subject, will be forwarded to the Government of India in reply.

3. The Government consider, with the Board, that the proposed system is not likely to prove feasible in this presidency.

No. 1247-16R., dated Bangalore, the 17th May 1878.

From—Major T. G. Clarke, Secretary to the Chief Commissioner of Mysore,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to the Resolution of the Government of India, No. 3-196, dated 24th August 1877, forwarding a Summary of the Rules for the inspection and grading of wheat and other grains in the United States, and requesting that it may be considered whether any similar system could be adopted in this country, I have the honour, by desire of the Chief Commissioner, to state that, in the opinion of those best competent to judge, a system such as that referred to cannot with any practical advantage be adopted in this Province.

No. 756-35, dated Rangoon, the 20th April 1878.

From—G. C. Kynoch, Esq., Assistant to the Secretary to the Chief Commissioner of British Burma,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to your Department Resolution No. 3-195, dated the 24th August last, enquiring whether a system similar to that in force in the United States for the inspection and grading of wheat could be adopted in this country, I am directed to say that the universal opinion of the mercantile firms in Rangoon, Moulmein and Akyab is, that the introduction of a system of grading paddy is not considered suitable to the circumstances of this province or to the conditions under which the rice trade is at present carried on.

No. 1672, dated Calcutta, the 2nd May 1878.

From—D. Barbour, Esq., Officiating Secretary to the Government of Bengal,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am directed to acknowledge the receipt of the Resolution by the Government of India in the Department of Revenue, Agriculture and Commerce No. 3-191, dated the 24th August last, forwarding a Summary of the Rules in force in the chief grain centres of the United States relating to the inspection and grading of wheat and other grains, and calling for a report as to whether any similar system could be adopted in this country.

2. In reply, I am to say that there is a consensus of opinion among all officers in Bengal who have been consulted on the subject that the system in question is unsuited to the present state of the trade and to the character of the people of this country. The Lieutenant-Governor therefore would not recommend any interference, by legislation or otherwise, on the part of Government with a view to introducing any such system for the inspection and grading of wheat and other grains, as prevails in the United States.

No. 249-169, dated Nagpur, the 21st January 1878.

From—L. NEILL, Esq., Officiating Secretary to the Chief Commissioner, Central Provinces,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am directed to acknowledge your Resolution No. 3-194, dated 24th August 1877, circulating papers regarding rules in force in the chief grain centres of the United States relating to the inspection and grading of wheat and other grains, and asking the Chief Commissioner to consider whether any similar system could be adopted in this country; and, if so, to suggest in what way the Government could assist, by legislation or otherwise, in introducing and carrying into effect an efficient system.

2. The Chief Commissioner has consulted the Commissioners of divisions, to each of whom a copy of the papers accompanying your Resolution was sent, and their views may be briefly epitomised. The Commissioner of the Chhattisgarh Division considers that this part of India is not yet ready for any such system, however well it might succeed at large centres of trade on lines of railway or seaports or navigable rivers. The Commissioner of Jubbulpore does not think that the system could at present be carried into effect, because (1) the native merchants are not sufficiently educated to appreciate it, nor are they under control of any body, such as the New York Produce Exchange, which could compel them to follow the necessary rules; (2) there would be great difficulty in procuring inspectors of requisite honesty and skill without very great expense; (3) the Railway Companies have neither the mechanical means nor the administrative staff necessary for carrying out the system. The Commissioner proceeds to say: "I am of opinion that it would be premature to introduce a system of compulsory inspection at present. But I think that the Railway Companies might take measures to procure the necessary cars and weighing machines; and that inspectors might be appointed experimentally at Bombay and some of the larger marts, whose duty it should be to examine and certify the quality of all grain voluntarily submitted to them. The effect of this would be to create a presumption against the quality of uncertified grain which would tend towards making inspection general. After some time the admirable system of the United States might be introduced." The Jubbulpore Municipal Committee, before which the papers were laid, not only considers that in the present state of matters the introduction of the American system would be premature, but that it would be obstructive to trade.

3. The Commissioner, Nerbudda Division, considers that the American system, if introduced at all—and he readily admits that the trade would be greatly benefited by an authoritative grading and by the facilities which this would afford for transfer of stock and for shipment, —must first be started at the large seaports, where alone produce in large quantities is warehoused.

The views of the Commissioner, Nagpur, are very similar to those which have already been given. He thinks the American system an admirable one, but only capable of realisation in an advanced country,

where capital has accumulated, where the standard of morality is high, and where mutual trust and confidence between business-men have been considerably developed. He shares the opinion of the Commissioner, Jubbulpore, that there would be great difficulty in procuring the proper inspectors, and that native merchants would be suspicious of, and might even question the classification of, an inspector-in-chief. He says: "As regards certain cereals, I believe that native and European notions of excellence are at variance; and although no doubt the inspector-in-chief might make his classification in accordance with prices ruling for grain to be exported, yet there would be difficulty if some of the grain intended for export were to be diverted, or if other grain were diverted from home consumption to export." As an indication of the habits of the people, the Commissioner reports that during the late famine traffic-sheds for warehousing and storing grain were erected at Nagpur, and that though the merchants had all bought their grain from the same parts, and the quality was probably exactly the same, they all desired partition of the sheds, so that each might have his grain separate.

4. The Chief Commissioner quite accepts the opinions which are so unanimously held by those whom he has consulted, that the American system is too advanced for the present circumstances of this country, and that an attempt at its introduction on the part of Government would be misunderstood and viewed with suspicion. An export trade in grain with Europe is only now growing up, and any action which might check this trade would be in a high degree impolitic. He is therefore not prepared to recommend that any steps, legislative or other, should at present be taken by Government with a view to introducing the American system of grading. As, however, he has long thought the development of the export trade of the Central Provinces a matter of great moment, and one to be furthered in every legitimate way, he has perused the papers sent by your Department with much interest, and now desires me to make the following remarks.

5. In the papers sent, information is conveyed regarding the rules in force in four places in the United States, *viz.*, (*a*) New York, (*b*) Chicago, (3) Illinois, (4) Milwaukee. The rules seem only to deal with one branch of the trade, that is to say, with the grain trade, including wheat, corn, oats, rye, barley and peas; and the Chief Commissioner presumes that similar rules have either been found unsuitable or not to be needed in respect to the trade in cotton, oilseeds, &c. This is a matter on which he would like to have some definite information.

6. Then, again, it is difficult to ascertain the precise amount and nature of Government or State interference exercised. In New York all the arrangements seem of a voluntary nature, and it is not apparent that Government, or officers appointed by Government, take any part in them. For instance, appeals from the inspector-in-chief's grading of grain, and complaints regarding neglect on his part and on the part of other inspectors, are investigated by the Committee on Grain, and the decisions of the Committee are again subject to enquiry by the Board of Managers of the Produce Exchange (rule 25, and rule 9).

In Chicago, however, the rules seem to have to some extent the sanction of law; for a duly authorised inspector of grain guilty of neglect of duty shall be deemed guilty of a misdemeanour. In contrast to the voluntary character of the New York rules and to the slight State interference noticed in the Chicago rules are the rules in force in Illinois. In the first place, a public granary of the (*a*) class is only contemplated in towns containing 100,000 inhabitants (and it may be noticed that there are no such towns in the Central Provinces). Licenses are then issued for such granaries and warehouses, and security bonds are entered into by those who desire to act as public warehousemen. In these public warehouses "separate bins" are provided for those who wish to keep their grain separately. In India, as has been already pointed out by the Commissioner, Nagpur, separate bins would for long be the rule and not the exception; and they are provided in Illinois, though to what extent they are used is not shown. But it must be borne in mind that this system of "separate bins" strikes at the very root of the New York arrangement, where the object of the system is to destroy the identity of particular lots. Some explanation of this material difference between the two sets of rule is wanted; though the Chief Commissioner presumes that it may in measure be due to the greater advancement of New York compared to Illinois—a view which is supported by the fact that at the former place all is done voluntarily, while in the latter the State takes the place of the Produce Exchange. In Illinois a chief inspector of grain is appointed by the Governor of the State; and this is certainly a measure which would have to be reproduced in India, for no private inspectors, much less a private inspector-in-chief, would command confidence. Lastly, in Milwaukee it would seem that the whole system is voluntary and under the management of a Chamber of Commerce.

7. If the Government of India can furnish Mr. Morris with a copy of the Illinois rules, and of the Acts of the Legislature bearing on them, he would be glad to have them, not so much because at the present time the system prevailing there could be adopted here, but because that system seems a nearer approach to what hereafter might be acceptable here, and would afford a good basis for Government action. It seems desirable, therefore, that information regarding that system should be before Government, and should be considered by Chambers of Commerce, Municipal Corporations, &c.

No. 34B., dated Hyderabad, the 6th February 1878.

From—A. J. DUNLOP, Esq., Officiating Second Assistant Resident, Hyderabad,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to Resolution by the Government of India No. 3-199, dated 24th August last, forwarding a Summary of the Rules in force in America for the inspection and classification of grain, I am directed to forward the accompanying copy of a letter No. C.-A., dated 17th ultimo, from the Commissioner, Hyderabad Assigned Districts, from

which it will be observed that that officer, and others whom he has consulted on the subject, considers the grain export trade of Berar is still too much in its infancy to permit of the adoption of any such scheme as is indicated in the papers under reference.

2. In this opinion the Resident fully concurs. Were such a system initiated by an association of the grain merchants at the chief seaport towns, the result might perhaps be found beneficial both to the merchants themselves and to the country generally. But, until a demand for a scheme of this nature is felt by those directly concerned in the trade, the Resident doubts if State interference or assistance would lead to any good results.

3. The past history of the cotton trade of Berar shows that much may be done towards developing trade by improving communications and opening markets so as to bring producers in direct contact with exporters; and Sir Richard Meade believes that it is in this direction, rather than by any system of inspection, that the grain trade of the Province can be developed and gradually placed on a firm basis.

No. C.-A., dated Camp Rail, the 17th January 1878.

From—W. B. JONES, Esq., Commissioner of the Hyderabad Assigned Districts,

To—The Second Assistant Resident, Hyderabad.

I have the honour, with reference to your endorsement No. 2943 of 26th September 1877, to submit, in original, opinions received from the Deputy Commissioners, Amraoti, Akola and Buldana, regarding the American system of grading wheat, and to state briefly that in my opinion the system is one which, if introduced at all, must be introduced in the first instance by arrangements between the Railway Company and the larger grain merchants of Bombay. The system is evidently a very convenient one, but there is nothing in the correspondence to show that the Great Indian Peninsula Railway Company are prepared to undertake so vast a change; and I would also remark that, until the Company can inspire traders with the belief that they can and will work the system well, there is no prospect of its successful introduction.

The wheat trade in Berar is still small, and local traders would certainly not at present consent to allow their consignments to be mixed up with other consignments of the same sort, and then to take delivery from a general stock.

No. 524, dated Amraoti, the 24th November 1877.

From—C. HORDERN, Esq., Deputy Commissioner, Amraoti District,

To—The Commissioner of the Hyderabad Assigned Districts.

I have the honour to return the papers received under your No. 2943 of 1877.

2. I do not think the American system described therein could be introduced here. In the first place, it would be necessary, if I have understood the system properly, for the Railway Company to agree to it and to become purchasers and warehousemen.

3. Even if it did agree, I doubt whether the grain-dealers would; for, in the second place, the business would depend upon the inspectors. Whether these men are to be appointed by the Railway Company or by commercial bodies is not clear; but there would have to be a large number of them, and there would be considerable difficulty in obtaining a supply of properly qualified men of such high moral character as to withstand the temptations in their way—at any rate, if they were to be appointed by the ordinary commercial bodies at all places of export.

4. I have endeavoured to ascertain native ideas of the American scheme, and, so far as it goes, the opinion is that it could not be worked here.

No. 1262C.-D., dated Akola, the 27th November 1877.

From—Lieutenant-Colonel C. T. O. Mayne, Officiating Deputy Commissioner, Akola District,

To—The Commissioner of the Hyderabad Assigned Districts.

No. 2942 of 1877, dated 26th September 1877.

With reference to your endorsement as per margin regarding the adoption of measures in Berar for improving the quality of Indian wheat, I forward two reports from the Khamgaon and Akola merchants, through Major Laughton and Mr. Bymanji, in which they clearly express their opinion that the Berar wheat trade is too small and insignificant either to bear the expense of the establishment proposed, or that it is necessary to grade or classify the wheat exported. I myself have also made enquiries, and the result tallies with the above.

In these opinions I perfectly concur.

No. 236, dated Khamgaon, the 5th October 1877.

From—Major D. W. Laughton, Assistant Commissioner, Akola District,

To—The Deputy Commissioner, Akola District.

In reply to your endorsement No. 1055C.-D., dated 28th ultimo, to correspondence asking for an opinion on the subject of adoption of measures for improving the quality of Indian wheat, I have the honour to state that I have consulted the European and Native merchants here on the subject, and they are unable to give any opinion on the subject, as the wheat trade here is too insignificant for such expensive machinery.

2. I do not think the wheat trade of Berar can be sufficiently extensive to warrant the entertainment of inspectors for this province, and the bulk of wheat forwarded at any one time would hardly be found large enough to introduce the system of grading, testing, trying and amalgamating of lots, so that the identity of particular lots be lost, and the consignee be entitled to merely a certain quality of a certain grade.

3. Doubtless, the cars in the United States are so built that the grain is stored in them in bulk without any bags or other receptacles. This could not be done in the wagons of the Railway Companies here.

No. 143 of 1877.

Memo. by Mr. Bymanji Jamasji, Assistant Commissioner, Akola District.

Reports that he has consulted the native merchants here on the subject, and is of opinion that the wheat trade in Berar is too insignificant to make it advisable to entertain the services of an inspector, &c. Its growth in the Pyan-ghât is very small; it is generally imported from Balaghât; and hence the system of trying, grading, testing and amalgamating of various sorts of wheat is impossible. Besides this, the expenses of the system will be too heavy to be borne by the peasant class.

If inspectors be at all appointed, they may be appointed at places from which wheat is exported out to Berar; and this may, perhaps, prove of some use.

No. 747, dated Buldana, the 11th December 1877.

From—Major J. T. Bushby, Deputy Commissioner, Buldana District.

To—The Commissioner of the Hyderabad Assigned Districts.

Adverting to your No. 2944 of 26th September 1877, I have the honour to state that the trade in the commodity alluded to in the correspondence accompanying your above-quoted letter not having as yet arrived to such importance as to render the introduction of the system therein contemplated absolutely necessary, I do not advocate it.

2. Adulteration in food-grain in this district is known to a very little extent, and is confined to petty dealers in daily markets. The more intelligent of the traders on a larger scale are sensible of the effects it produces in deteriorating the value of the commodity.

3. The correspondence, moreover, particularly, I imagine, refers to places on the line of railway and on the seaboard. Those portions of the two southern talukas of this district where wheat is produced to some considerable extent lie upwards of 50 miles from the nearest railway station and some 400 miles from the nearest seaport; and what comparatively small surplus (in a commercial point of view) remains after local consumption finds a ready sale in the rural markets of this as well as of the adjoining districts of these Provinces and His Highness the Nizam's Dominions. Outside traders generally make their purchases in small quantities and on the spot, so as to allow very little margin for introduction of a system suitable in places where mercantile transactions in the commodity take place on a grand scale.

4. The food-grain exports of this district are not so extensive as those of cotton. If the Cotton Frauds Act could not find a footing here, much less would the introduction of the system now under consideration; and any step towards it would simply be taken in the light of an official interference with the free trade of the country, which is in its infancy.

No. 1729, dated Bombay Castle, the 31st March 1879.

From—Hon'ble E. W. Ravenscroft, Chief Secretary to the Government of Bombay,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With their Resolution of the 24th August 1877, No. 3-190, the Government of India forwarded a Summary of the Rules in force in the chief grain centres of the United States for the inspection and grading of wheat and other grains. At the same time, they requested this Government "to consider whether any similar system could be adopted in this country; and if so, to suggest in what way the Government could assist, by legislation or otherwise, in introducing and carrying into effect an efficient system."

2. The Resolution and the summary have been given a wide circulation in this Presidency among officers best qualified to give an opinion on the subject. The reports they have submitted show that any attempt at official interference with the grain trade of the territories subject to this Government would be productive of more harm than good.

3. As the Government of India are aware, the land in these parts is occupied, as a rule, by numerous petty cultivators. These men, according to their means and opportunities, sow their fields with seed of different qualities; and not unfrequently they find it to their advantage to sow seeds of several qualities mixed together in the same field. The crops thus raised are of great variety; and to test and grade them would therefore be a task of no small difficulty, even if the cultivators were to deal direct with the large merchants who carry on the export trade of the Presidency. But the conditions obtaining here are such that, as a matter of fact, the surplus produce of the fields, which, after satisfying the wants of the local market, is available for export, has generally to be collected by a class of middlemen of small means, whose way of storing the grain only serves to mingle together the numerous varieties. Under these circumstances the work of grain inspection would be so difficult, that it would require an establishment extending to almost every village in the Presidency to perform it satisfactorily.

4. The cost of such a large establishment, especially considering that liberal salaries would have to be paid in order to secure honesty, would be enormous. The grain trade of this Presidency, which may as yet be said to be in its infancy, and which has few facilities for its expansion, would be oppressed, if not ruined, by such a burden being imposed on it. Besides, there is every reason to believe that the work of inspection would be extremely unpopular, the interference with trade would be considered unnecessary and vexatious. and the measure undertaken by Government for the benefit of its subjects would only serve to excite in them feelings of suspicion and opposition. For all these reasons, His Excellency the Governor in Council is much averse from any interference on the part of the State with the grain trade of this Presidency, and he would decidedly prefer that the trade should be left to take its own course.

5. Copies of the reports on this subject, submitted by the Commissioner in Sind, and the Commissioners of the Northern, Southern and Central Divisions, are herewith forwarded for submission to the Government of India. They will be found to contain much useful and interesting matter.

No. 913, dated Kurrachee, the 8th March 1878.

From—F. D. MELVILL, Esq., Acting Commissioner in Sind,
To—The Chief Secretary to the Government of Bombay.

I have the honour to report on Government Resolution No. 6207 of the 17th October last.

2. The Kurrachee Chamber of Commerce has reported direct to the Government of India that in their opinion the American system of storing and grading wheat is altogether impracticable for Kurrachee, and they are not prepared at present to recommend any special legislation for the purpose. The Collectors of Kurrachee, Hyderabad and Shikarpur, and the Superintendent, Upper Sind Frontier, have also reported against the proposal. Of these, the Collector of Kurrachee reports (with reference to the report of the Chamber of Commerce) that he does not see how the American system can be organised except by the members of the trade itself. The Collector of Hyderabad states that the proposed measures would be premature until the cultivators can be induced to improve upon the present system of wheat cultivation. The Collector of Shikarpur states that it would be a question whether Kurrachee could support the requisite establishment; that this is a question which can only be answered at Kurrachee itself, but that the traders at Sukkur (the port of Upper Sind) are conservative to a degree, and that it would not do to try any such experiment there until it had been tried and succeeded at Kurrachee. The Superintendent, Upper Sind Frontier, states that the amount of wheat exported is so small, that no such rules could be carried out in his district, and that the question is one that must be decided in regard to Sukkur.

3. The Political Superintendent, Thar and Parkar, is not so opposed to the proposed rules, although he admits the fact that they are generally very much in advance of the present state of the Province. He proposes that, as a commencement, a public warehouse of the description of class (*a*) of the Illinois Laws should be established at Kurrachee, and a suitable importing agency appointed by the Chamber of Commerce.

4. Although agreeing with this latter officer as to the great advantage that would be gained by any successful attempt to promote the growth and export of first class wheat, I still cannot recommend the adoption of the rules forwarded with the Government Resolution under reply, or the advisability of legislative action in the matter. It would, I believe, be impossible in the present state of the Province (even when the Indus Valley State Railway is opened) to carry out any such rules in regard to grain before it reaches Kurrachee. Whether it would be possible to carry them out at Kurrachee is a question on

which we must, I consider, be guided by the opinion of the local Chamber of Commerce; and that opinion is decidedly against it. But even if it were possible to carry them out, I should still be averse to the attempt being made and enforced by the legislative authority. I cannot but think that it is a mistake to fetter trade in this way under any circumstances; still more so when the merchants connected with the trade have expressed a decided opinion against any such action being taken. They may be left to look after their own interests. So far as the trade is concerned (after the grain has left the hands of the actual producers), the matter is in their own hands; and, so far as the actual production is concerned, the only influence that can be brought to bear is indirect, whether it proceeds merely from the merchants, or from the force of a Legislative Act.

No. 215, dated Camp Sanand, the 22nd January 1878.

From—H. N. B. ERSKINE, Esq., Acting Commissioner, Northern Division, Bombay,

To—The Chief Secretary to the Government of Bombay.

I have the honour to submit the information called for in Government Resolution No. 6207 of 17th October last, on the subject of the inspection of grain for export to Europe.

2. Under the system in force in the United States, grain is divided into grades, the standard of each of which is declared by commercial bodies, by inspectors who grant certificates showing the grade and quantity of each consignment brought to port and warehoused by the railway companies. These certificates are transferable, and the holders of them are entitled to delivery from the railway company of the quantity and quality of grain specified in them. The inspectors are remunerated by fees.

3. A system of this kind could hardly be worked in this presidency, except perhaps at Bombay and Kurrachee; and could only be worked at these places if the railway companies were prepared to warehouse large quantities of grain, and if efficient inspectors, who could secure the confidence of the trading community, could be secured.

4. Doubtless, were the system introduced, standards for wheat and other food-grains would before long be determined; but as the papers forwarded show good inspection is not easy to obtain—good inspection "involves having a man as inspector-in-chief who is able to discriminate by eye, touch and smell the several qualities of grain that pass before him, and whose moral character is such as to withstand the efforts that are made by receivers to secure for their grain a higher grade than that to which it should properly be assigned"—to secure the services of such men in this country would not be easy.

5. But, putting aside for the present these considerations, is inspection of the kind suggested needed to develop a trade in food-grains? The general opinion, I find, is that it is not wanted.

6. The Collector of Ahmedabad is of opinion that that district is not likely to export much grain, and gives the following figures to

illustrate the course of trade from the only two ports in the district, *viz.*, Gogo and Dhollera—

Year.	Imports.		Exports.	
	Gogo.	Dhollera.	Gogo.	Dhollera.
	Cwt.	Cwt.	Cwt.	Cwt.
1874-75 ...	6,447	51	161	5,035
1875-76 ...	2,539	100	519	2,922
1876-77 ...	10,533	100	2,357	2,476
Total ...	19,519	251	3,037	10,433
Grand Total ...	19,770		13,470	

which shows that by sea imports exceeded the exports by 6,300 cwt.

7. What the exports by train were the Collector has not been able to ascertain.

8. Mr. Lely, also writing from the Ahmedabad district, remarks: "At present the question here is of purely theoretical interest, no wheat having been sent forward for export from Ahmedabad for several years past. On the contrary, it is a fact strikingly illustrative of the extent to which our people have become consumers of this grain, that large quantities of Jubbulpore wheat are now being brought into the district by rail, in order to supply the vacuum caused by exports to the famine districts in the beginning of the season. And this notwithstanding that all the bajri, and most of the jowar, harvest has just been reaped.

"I do not doubt, however, that, when the circulation of grain in India resumes its normal course, any great demand for Europe will draw away a more or less large amount of Ahmedabad wheat; but even in that case there will scarcely be any necessity for legislative interference. There is only one variety likely to find its way to the exporter, *viz.*, the daudkhani or white wheat of the Dholka black soil district; and I am informed on good authority that there has never been any cause of complaint against it on account of admixture of inferior grains or other foreign substances. The native merchants here aver that there is only an average of two seers (kutcha) of dirt per maund in Ahmedabad wheats against four or five in the Jubbulpore now arriving; and in this the Agents of Messrs. Ralli (the only European firm, I believe, who have dealt much in Ahmedabad wheat) bear them out, so far as to say that they have found Ahmedabad wheat a little cleaner, generally speaking, than ordinary Jubbulpore, and that it contains no inferior grains.

"On the general question of the wheat trade, I may remark that, so long as the present unprofitable method of agriculture continues, this district will never be able to supply more than its own wants, and consequently will never send away much while the European rates are at their ordinary level. Any increase in those rates sufficient to stimulate

export would, I humbly think, be probably a curse to the district in the guise of a blessing. I have already pointed out in my No. 27 of 29th April last how, from perfectly intelligible causes, the price of jowar and bajri gradually rose in comparison with wheat during the cotton mania, until in 1863 in our western districts the superior grain was actually the cheaper. This led the lower classes to acquire taste for it, which is the best legacy inherited by the district from those times of frenzy; for good wages and the comparatively moderate price of wheat since have enabled them to keep it up. It appears to me, if I may be allowed to use a quaint expression of their own, that any export trade springing up under these circumstances will be taking food from the stomachs of the people to put into their pockets. That the average outturn does not much, if at all, exceed the annual demands of the district, or at any rate of the province, may be inferred from the fact that, notwithstanding the very limited exports of previous years, the comparatively trifling withdrawal for the famine districts has left us dependent on imports from Jubbulpore. Unless consignments to Europe can be replaced from the same quarter (which is very doubtful), they will be taken from the mouths of the local consumers, who will be forced back upon their former inferior diet, and so lose the distinctest gain they have yet made under British rule. Further extension in the area cultivated with this grain is almost impracticable from natural causes; and any attempt to do so is to be deprecated in a zilla which has already suffered so much from over-production. I humbly think the best mode of assisting to create a really healthy and beneficial export trade in the agricultural produce of a long-settled district like this is a judicious enquiry into and reform of its methods of agriculture. Into that subject it would be out of place for me here to enter."

Mr. Borradaile, the Collector, expresses concurrence in the above views.

9. From Kaira, the Collector, Mr. Sheppard, writes: "The trade in cereals, and especially in wheat, is not so extensive in this district as to admit of the introduction with advantage of so complicated and expensive a machinery as that contemplated by the rules accompanying the Resolution above quoted.

"I believe that any attempt to burden the existing trade with taxation for the payment of to salaries inspectors, &c., would tend to paralyse, instead of to encourage it."

10. The Acting Collector of Broach, Mr. W. Loch, remarks as follows on the proposal to appoint inspectors:—

"The wheat trade is at present carried on in the following way. Small dealers in the villages purchase the grains from the ryots, and keep it in their houses till a considerable stock has accumulated; and they then sell it to the large dealers in Broach and Jambusar, who export it. Some of the wealthier ryots may deal with the large merchants direct. If a ship happens to be ready to sail for Bombay or elsewhere, the grain merchant will send off his wheat at once; but he keeps it in his warehouse for some time. There the wheat is heaped on the earthen floor, or, if it is to be kept for a long time, on a layer of wheat straw. The wheat which is sent by rail is put in gunny bags, while that

which is sent by boats is shipped in bulk, and no precautions are taken to protect it, except that in the opening of the rainy season a *chupper* is made over it. From Jambusar all the wheat goes by boat; from the rest of the district a considerable amount goes by rail as well.

"I do not see how with a trade conducted in this manner we could have a system of inspection at all like that in force in America. There the inspector (in New York for instance) is a very responsible officer, and he examines and classes the wheat on its arrival; and his certificate is supposed to ensure that the wheat is of such and such a class, and it is purchased on the strength of that certificate. This is doing much more than we have ever done for cotton; and I do not think we could get the men to do the inspector's work in places like Broach and Tankaria. The trade is not one which will bear the payment of heavy inspection; and unless we have well-paid European officers, the inspection would become worse than useless.

"Again it seems to me that wheat shipped in bulk in open boats stands a good chance of deteriorating on the way to Bombay, and that it would not be of the same class on arrival there that it is here.

"I think a system of inspection which might be very successful in America would fail here, because here it would be carried out by Government officers, who would receive no help but perhaps opposition rather from the grain merchants. There it is carried out by the grain-dealers themselves, who have every reason for wishing the system of inspection to be thoroughly carried out.

"The utmost that Government could do would be to have a system of inspection to prevent frauds similar to the present system of cotton inspection. I do not think myself that this would be advisable, as I believe the trade will look for itself."

11. The Collector of Surat, Mr. Pratt, is also of opinion that Government interference with the wheat trade would not lead to beneficial results. He writes: "In my opinion no interference with the wheat trade on the part of Government is called for, or would be attended with beneficial results.

"The people of the country are quite able to take care of themselves and their interests; and as soon as it is to their interest to sell a certain article of a certain quality, the article will be provided equal to the demand for it.

"Until the trade express a desire to have Government assistance, I do not see that it is the province of Government to press upon them what they do not want; and I am certain that, as regards native traders, the less the interference the better is the chance of developing a new trade.

"I am quite of opinion, with the Bombay Chamber of Commerce, that the time has not yet come for introducing the system in force in America, and that no Government interference is at present necessary in respect of the wheat trade."

12. Mr. Jervoise, the Collector of Tanna, remarks on the Government Resolution as follows: "The prime object aimed at appears to be that stated in the preamble to the rules in force in the United States, namely, to ensure the delivery of wheat and other food-grains of defined

qualities to purchasers at shipping ports, by which I understand that the measures sought to be introduced are such as shall ensure every merchant at a shipping port obtaining for export the description and quality of grain that he wants (if obtainable), instead of being obliged to take something different, or go without.

"The first question that occurs to me is this,—Have the merchants at shipping ports in India ever asked for any protective measures of this kind? If they have not, why introduce them? In introducing such measures, will not Government become subject to very much the same description of remonstrance as has been put forward against the protection of cotton?

"The introduction of similar rules to those in force in the United States must be attended with considerable expense; and I presume that this will entail the levy of fees from the merchants who are to be benefited. Unless they have asked for the adoption of protective measures, the Chamber of Commerce will, I think, at once enter a protest against any action, and as with cotton, so with grain, will say the merchants can protect themselves.

"With all due deference, it appears to me that the clearest course to be followed, if such measures are considered necessary, would be first to consult the Chamber of Commerce. The merchants at the shipping ports must know better than any one else where an evil lies in their trade interfering with it; and their knowledge and experience in dealing with the suppliers would enable them to state what remedy, if any, is required or is feasible. The Collectors might then be able to state what could be done up-country for the inspection, grading and warehousing of grain at large railway centres, or at any port whence grain may be exported direct to other countries.

"The printed rules, if I understand them rightly, only show what arrangements are made at large central marts from which grain is transmitted by rail or canal to the port of foreign export and at such ports. It does not appear that any such measures are adopted at other places or railway or canal stations where limited quantities of grain may be loaded and sent for sale to the port. In fact, the expense of keeping up establishments at small stations would be too great. I think then the Chamber of Commerce might be asked to name the central grain railway or other stations from which grain is despatched to the ports for export, and at which an inspection and grading establishment and warehouses might be located."

13. In the Colaba district wheat is neither grown nor consumed.

14. Mr. Ramsay, Collector of Nasik, expresses his opinion in the following terms:—

"I doubt if India would ever—certainly not for very many years to come—be ripe for such a system as that existing in America. The nature of the country, the character of the dealers, and the scope of the grain trade are so vastly dissimilar in the two countries, that no comparison can be drawn. America is an enlightened and enterprising country with an export grain trade of enormous proportions; and, by a happy combination of growers, carriers and exporters, a system has been adopted which has been found beneficial to all parties concerned, and to the State also.

in natural consequence. In India all these conditions are reversed. As yet at least the export grain trade is on a very small scale. Producers, middlemen and exporters, all have, or think they have, separate interests. At least in practice it would, I think, be found impossible to invite them in one common aim and action, as in America. Traders in this country are always jealous and suspicious of any Government interference; and any system of grain inspection enforced by law might have a most calamitous effect upon the grain trade and the supply of food. The American system is based upon a voluntary co-operation of all parties through whose hands the grain passes, and such a combination would be impossible in India. Again it would almost be impossible to grade wheat here as in America, for the simple reason that the ryots, as a rule, sow many varieties of seed in one field; and unless the law were to step in here and dictate to the farmer what seed he should sow, perfect grading would be impracticable. The financial difficulty is also a serious one, as I do not see how the trade could bear the inspection expenses. In conclusion, it seems to me only necessary to point to the agitation raised against the Cotton Frauds Act, to judge of how far Government interference would be tolerated in the grain trade.

"The remedy lies, I think, in the hands of the Bombay and other exporting merchants, who by refusing to accept any but really good qualities of grain (and they can make their own arrangements for testing and sampling) will ultimately compel the up-country dealer to improve the quality of his consignments."

15. The Collector of Khandesh, Mr. Propert, reports: "I have read through the Summary of the Rules for the inspection of grain in the United States, and can find nothing at all in any way applicable to the present condition of the grain trade of this district. The elaborate system of inspection and classification obtaining in the States appears to be many years in advance of the requirements of our conservative bania grain-dealers, and if introduced here, even in a modified form, could have no other effect than that of harassing the people, and hurrying on the traders faster than they desire or are prepared to travel. Any legislation on the subject would certainly be many years in advance of the requirements of the country."

16. The foregoing remarks show very clearly, I think, that any idea of having inspectors anywhere from Bombay must, if it was ever held, be abandoned. There is no place in the Northern Division where the trade is such, or is soon likely to be such, that it could pay for the supervision necessary to ensure the effective working of a scheme such as exists in America. Could then the system, if it could not be advantageously introduced in districts beyond Bombay, be introduced into Bombay itself? This is hardly a point on which I can offer an opinion, as I have had no opportunities of discussing the subject with any of the mercantile community; but, so far as I am able to judge, the American system is not suited to Western India.

17. Where, as in America, enormous areas are grown with food-grains of very much the same kind and quality, the work of testing and grading would be comparatively simple and easy; and all that would be needed to ensure effective working would be good supervision. In this

part of the country however, and everywhere throughout Western and (I may add) Southern India, the land, instead of being cultivated by farmers owning large areas and growing for export, is occupied by petty peasant proprietors who grow mainly to supply their own wants and the local market. The consequence is, that what is available for export is generally collected by a class of middlemen from a number of cultivators, and that this middleman's stock represents a great variety of grain, both as to description and quality. To grade this accurately would be almost impossible. The different cultivators have used different seed. Some of this seed may have been all of one quality, but some much mixed; and again when the different kinds of grain have been purchased, the middleman stores them in a way to mingle them still more. But it may be argued, if this is so, then there is all the greater need of supervision. This in one sense is true; but as you cannot have supervision that will extend to every village, supervision will be practically useless; and I doubt if any amount of supervision at the port of export would really affect the growers *except where wheat or other grain is grown in large quantities for export*; and, where it is so grown, self-interest will act more effectively than Government interference.

18. If, on the other hand, the trading community at Bombay are anxious to have some system of the kind referred to introduced, and are prepared to superintend the working of it, then I should say by all means let the experiment be tried, but let this be under mercantile not Government supervision. By this I mean that the direct control and management should, as in America, be left to the mercantile community. If they cannot undertake this, it is not for Government to step in and do it for them; and it may then safely be affirmed that the time for interference has not arrived.

No. 5600, dated Poona, the 31st December 1877.

From—E. P. ROBERTSON, Esq., Revenue Commissioner, Southern Division,

To—The Chief Secretary to the Government of Bombay.

Having now received the reports of the Collectors, Southern Division, on the subject of Government Resolution No. 6207, dated 17th October 1877, I have the honour to submit for the information of Government the following substance of them.

2. The Collector of Ratnagiri briefly intimates that wheat is not grown in this district, and therefore he has no remarks to offer.

3. Mr. Norman, Collector of Poona, is of opinion that no system of grading wheat similar to that prevailing in the United States of America is either practicable or required in this country. He observes that the system in force there is the result of private arrangement; but, if introduced into India, it would have to be carried out by an army of Government officials, and must necessarily interfere with trade. The outcry against the arrangements in force for preventing the adulteration of cotton shows very clearly what the opinion of the mercantile community is likely to be with respect to any measure of the nature suggested.

Under these circumstances he considers that the wheat trade should be left to take care of itself, every information at the same time being afforded as to the qualities best suited for the European market.

4. The Collector of Satara, Mr. Moore, while stating that the matter is one on which a merchant can express a more valuable opinion than he can, observes that the arrangement sketched appears to him to be far too elaborate for this country, and that he is not aware of any necessity for such strict inspection, in so far at least as the Satara District is concerned. To obtain the services of an inspector-in-chief with the necessary qualifications would, he thinks, be most difficult in Bombay, and impossible in the interior. We might find men who know grain, but the moral character would be the stumbling-block, unless the salaries were high; and even then he fears we shall be merely adding in many instances to the many doors for fraud which already exist without any compensating advantages.

5. Mr. Percival, Collector of Sholapur, is of opinion that this part of the country would not benefit by a system of inspection. He observes: "The object is to make a consignment of wheat as exchangeable as a bank-note. It therefore requires *very* perfect inspection and great uniformity in grading." And he adds that there is not enough trade, and the consignments are too small, to pay for such men as would be needed for this work; while it is doubtful if there are men to be found in this country combining the necessary knowledge and high moral qualities. Mr. Percival considers that, if the wheat trade should grow to very large dimensions, some such system of inspection may be gradually started at *great* centres of trade, but that at present any attempt to help the merchants is more likely to do harm than good. When the want is felt, they will very likely come to Government for assistance.

6. Mr. Candy, First Assistant Collector in charge, Ahmednagar, states that he does not think the introduction of the system in India would be acceptable to the traders of this country; while any interference on the part of Government in enforcing such a measure would, at all events until the grain trade is more developed, be viewed with suspicion by the natives. He remarks that it will be observed that the system in force in the United States is chiefly an arrangement between the grain merchants and railway companies; and that should such a system be found necessary in this country, the Chamber of Commerce will no doubt in due time urge its adoption.

7. I concur in the opinions expressed by the Collectors of this division as to the inadvisability of introducing the system of inspection of wheat proposed by the Government of India.

8. The Government of Bombay, and even the Government of India, must be fully aware of the very strong opposition there has always been to the Cotton Department. With regard to inspection of wheat, the opposition of the mercantile community would, it appears to me, be stronger far than it has been as regards cotton inspection, and with far greater reason.

9. Government will perhaps recollect that during the discussions on the Cotton Frauds Act it was argued by the opponents to that Act that, if that Act were passed, Government might desire inspection of all

produce; and this might go so far as to extend even to the inspection of wheat, intending thereby to show that any interference was unnecessary.

10. The inspection of cotton I consider a necessity, as that staple can be, and is so readily, adulterated with different varieties and mixed with refuse. Such adulteration cannot be remedied; and the detection of refuse is next to impossible when cotton has been baled. Admixture of wheat is, on the contrary, at once discernible, and can easily be remedied.

11. The rules adopted in the United States emanate from the mercantile community; and the States Government has not the trouble, difficulty and opprobrium of working them. If any such rules are at any time required in this country, it will be quite sufficient for the Government to leave such measures to the different Chambers of Commerce. At present all that is necessary is that the Chambers be made acquainted with the procedure in America.

12. At any rate no steps whatever for introducing Government inspectors should be taken till the Chambers have been consulted, and till they say they deem inspection necessary, and that they themselves are helpless.

No. 3223 dated Belgaum, the 9th November 1877.

From—A. GREY, Esq., Revenue Commissioner, Central Division, Bombay,

To—The Chief Secretary to the Government of Bombay.

With reference to Government Resolution No. 6207, dated 17th ultimo, I have the honour to state that the Collectors of Belgaum, Dharwar and Kaladgi, the districts in this division in which wheat is produced, are unable to offer any practical suggestions for giving effect to the rules in force in the chief grain centres of the United States relating to the inspection and grading of wheat and other grains.

2. It has, I believe, already been pointed out to Government by the Bombay Chamber of Commerce that the system in force in the United States of America was introduced for the sole purpose of securing rapidity in dealing with the enormous masses of grain produce in that country, where grain is always dealt with in bulk, and of preventing the trouble and inconvenience of dealing with and identifying individual lots. The system of inspection appears to be organised by arrangement between the various bodies of grain merchants and the railway companies, and does not imply the necessity for any Government interference. I am of the same opinion as that already expressed by the mercantile community, who are most interested in such a measure, that the Indian grain trade is not yet sufficiently developed to render the introduction of the system in force in the United States convenient or desirable.

No. 83, dated Camp Mogra, the 5th February 1878.

From—A. C. LYALL, Esq., Offg. Chief Commissioner, Ajmere and Merwara,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to paragraph 2 of Government Resolution No. 3-198, dated 24th August 1877, enquiring whether a system similar to that in

force in the United States regarding the inspection and grading of wheat could be adopted in this country, I have the honour to transmit copy of a letter No. 88, dated 25th ultimo, from the Commissioner of Ajmere, reporting that there is not sufficient wheat grown for export to adopt these measures.

No. 88, dated Ajmere, the 25th January 1878.

From—L. S. SAUNDERS, Esq., Commissioner, Ajmere and Merwara,
To—The Chief Commissioner of Ajmere.

With reference to your No. 603, dated 4th October 1877, and subsequent reminder No. 48, dated 17th instant, on the subject of adoption of measures for improving the quality of Indian wheat, I have the honour to inform you that it does not appear that there is sufficient wheat grown for export in this district to make it worth while to adopt any measures for inspection and grading of wheat.

No. 1571A., dated Naini Tal, the 8th June 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,
To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to correspondence ending with your reminder No. 114C., dated the 29th of April last, I am directed to submit, for the information of His Excellency the Governor General in Council, a copy of the papers marginally noted, being a report on the proposal to introduce into India the American system of inspecting and grading wheat and other grains, and to state that the system seems to the Lieutenant-Governor and Chief Commissioner unsuited to this country, or at least to these Provinces.

From the Director of Agriculture and Commerce, North-Western Provinces and Oudh, Nos. T.—633A. and T.—336A., dated respectively the 12th December 1877 and 31st May 1878.

No. T.—633A., dated Camp Saharanpur, the 12th December 1877.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,
To—The Secretary to the Government, North-Western Provinces and Oudh.

With reference to your No. 2216A., dated the 27th of September 1877, I have the honour to submit the following remarks on the rules for inspection of grain in the United States.

2. In paragraph 2 of the Summary of the Rules appended to the Government of India Resolution No. 3-192 the object (not "one of the objects") of the rules is stated to be that of "ensuring the delivery of wheat, &c., of defined qualities to purchasers at shipping ports"; and if that is the only object, the introduction of any similar rules in the North-Western Provinces would not tend in any way to secure it.

3. The inspection of grain arriving at New York is not made until it arrives at New York, where inspectors enter upon railway cars on

their reaching the New York terminus. Grain is then classed and put into a warehouse attached to the railway until it is shipped or bought.

4. Consignments for shipment from Cawnpore and other marts in the North-Western Provinces to Howrah would not therefore be inspected and classed in the North-Western Provinces, but at Howrah. The necessity of classing at the place of destination, and not at the place of departure, is evident. The classification at any one given market must be uniform; and all grain collected there must be valued by the same set of inspectors under the same schedule.

5. But it appears not to be the case that the only object of the rules is to "ensure the delivery of defined classes of grain to purchasers at shipping ports" (although no other is stated in the summary). There are, for instance Illinois rules, Chicago rules, Milwaukee rules—all of which places are inland or on lakes.

6. The rules quoted seem to be very incomplete, and are apparently only extracts or summaries. No "objects" and "reasons" are given with them, and it is not clear what is the entire scope of the ends intended to be gained by them. The only advantage which comes out with any clearness is their convenience to merchants engaged in the grain trade.

7. The fullest information given is contained in the summary of the Illinois rules, under which public warehouses for the storage of grain may be established in any large town; in which warehouses the deposit of grain is optional, not compulsory, *i.e.*, there is no compulsion to deposit grain for classification under Government inspectors.

8. The real question seems to be, therefore, whether it would be in any way convenient to the traders of Cawnpore, Agra and other marts of these Provinces to be able to avail themselves of public warehouses in which grain might be stored and classed under Government inspection. I have put this question through the Collectors of Cawnpore and Agra to the traders of those places, and will communicate a definite reply to Government on receiving their reports.

9. The public object of securing true descriptions of grain for export is not (as I expected to find the case) anywhere expressly stated to be an object of the rules, which are apparently framed entirely for the convenience of local traders at each mart. A warehouse system at Cawnpore and other inland marts would not, however, tend to secure a true description for exported grain of which the classification must take place at Howrah or Bombay, the collecting ports. The only question which applies to the North-Western Provinces is that therefore to which I have given expression in paragraph 8.

No. T.—336A., dated Allahabad, the 31st May 1878.

From—F. N. WRIGHT, Esq., Offg. Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government, North-Western Provinces and Oudh.

With reference to Government order No. 1187A. of 8th May 1878, I have the honour to report that, as desired by Mr. Buck, I have

personally consulted the leading grain merchants, European and native, in Cawnpore; and the Collector of Agra has similarly consulted the merchants in that city.

2. The result of these enquiries is adverse to the proposal of introducing rules identical with or similar to those adopted in America respecting the inspection, classification and storage of grains. The general tenor of the replies of merchants is to deprecate Government interference in this direction; and, whilst admitting the great advantage that might be derived from any system that would ensure the shipment of high class grains only, the merchants are of opinion that rules which require such strictness of detail and such thorough probity in those who would have to work them are not adapted to the existing conditions of trade in these great marts.

3. Grain, like other staples of Indian trade, is collected from innumerable small producers by middlemen (arthya), who supply the large European exporters, but themselves also act as exporters. It is at this point that so much dishonesty prevails; and yet, whilst merchants recognise the great blot in the system, they do not see the practicability of any immediate reform. They themselves retain the collected grain for as short a time as possible; they have no wish to store. Indeed, the liability of wheat to the ravages of the weevil is directly opposed to any safety in storing. They consider themselves competent to arrange for the classification of grain, and they are promised the support of a Committee "consisting of members of some of the principal firms in Calcutta, English millers and contractors appointed by the Mark Lane Exchange" (such as already exists in the oilseed trade), which will afford all the protection to exporters and shippers that appears called for.

4. The appointment of a necessarily large body of inspectors would, in their opinion, open the door to a wide system of peculation and bribery.

"Government interference," writes one merchant, "ruined the saltpetre trade; and was a questionable benefit to cotton in Bombay. In both cases Government subordinates were found to have a price, and dealers found it to their interest to offer bribes."

5. As noted by Mr. Buck in his letter dated the 7th of December 1877, merchants suggest that the necessity for grading, classification and storage in India arises at the sea-ports: it is there, if anywhere, the experiment should be first made.

6. Though not strictly part of the present subject, yet as persistently urged in connection with it by merchants in their conversation and correspondence with me, I venture to bring forward the great injury done to a growing trade by the insufficient and irregular supply of carriage provided by the East Indian Railway. Through facilities for immediate or at least early despatch would obviate any necessity for storage in what is in reality only a collecting market. I am informed that it has become necessary for the merchants in this city to urgently address the Railway authorities on this subject, as the possibility of their fulfilling their sale contracts is, even under the ordinary circumstances of trade, this year becoming seriously imperilled. I venture to hope this may not altogether escape the attention of Government.

No. 2085A., dated Naini Tal, the 17th July 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of my letter No. 1571A., dated the 8th of June 1878, I am directed to submit copy of a letter* from the Commissioner of Meerut, regarding the proposal to introduce into India the American system of inspecting and storing wheat and other grain.

* No. 44, dated the 13th June 1878.

No. 44, dated Mussoorie, the 13th June 1878.

From—W. C. PLOWDEN, Esq., Commissioner of the 1st (or Meerut) Division,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

Referring to your office No. T.—203A., dated the 8th of May, and subsequent correspondence closing with your No. 787A—C-VII, dated the 3rd of June, I have the honour to state that, in my opinion, the adoption of the rules summarised in the Proceedings of the Government of India No. 3-192 is not feasible in this country.

2. The object of the rules regulating the system of inspection of grain adopted in the United States is to ensure the delivery of wheat and other food-grains of defined qualities to purchasers at shipping ports.

3. To do this satisfactorily, the first requisite is a standard for each grade of wheat and other food-grains. These standards have to be made up early in each season as the new crops come in.

4. Next, inspection of such a character as to certify that the grain passed is of the quality it represents itself to be.

5. At present, and for some time to come till rapid communication is more universal, it will be impossible to secure either of these requisites, and I am of opinion that it would not be practicable to carry out the rules in this country.

6. Your enclosures are returned.

No. 3108, dated Shillong, the 28th September 1877.

From—T. J. MURRAY, Esq., Offg. Secretary to the Chief Commissioner, Assam,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am directed to acknowledge the receipt of Government Resolution No. 3-197, dated 24th August 1877, giving cover to a Summary prepared in your office from the papers received from Her Majesty's Secretary of State of the Rules for the inspection of grain in the United States, and in reply to say that no wheat is grown in this Province.

2. There is a considerable export of mustard seed; but it is a new industry that has sprung up in this Province within the last few years.

The mustard seed trade is in the hands of the Marwaris, who are foreigners to the Province, and many of whom are mere adventurers with no real capital. There are no corporate bodies, such as Chambers of Commerce, in this Province.

3. Under the circumstances the necessary inspection could not be procured at any reasonable cost.

4. The scheme is, the Chief Commissioner fears, far in advance of the existing commercial wants of this Province.

Dated Calcutta, the 23rd January 1878.

From—H. W. I. Wood, Esq., Secretary to the Bengal Chamber of Commerce,

To—The Assistant Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

The Committee of the Chamber of Commerce desire me to state, in acknowledgment of Mr. Lyall's letter No. 3-202 of 24th August last, that the system of inspection of grain adopted in the United States of America is not suitable to the trade of this country.

The circumstances and course of the grain trade of India, which is exclusively in the hands of native merchants, differ so essentially from those of the United States, that any assimilation of system of grading, warehousing and inspecting would, the Committee believe, be utterly impracticable.

Dated Bombay, the 24th October 1877.

From—J. Gordon, Esq., Secretary to the Bombay Chamber of Commerce,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I am directed to acknowledge the receipt of the Resolution of the Government of India No. 3-201, dated the 24th August last, forwarding certain papers regarding the grading and delivery of wheat in the United States, and requesting the Chamber to consider whether any similar system could be adopted in this country; and if so, to suggest in what way Government could assist, by legislation or otherwise, in introducing and carrying into effect an efficient system.

In reply, I am directed to state that the system of inspection referred to in these papers seems to be one organised by arrangement between the various bodies of grain merchants and the railway companies, and does not imply any Government interference of any kind. The system has nothing whatever to do with the improvement of the quality of grain, but has evidently been introduced for the sole purpose of securing rapidity in dealing with the enormous masses of grain produce in the United States where, the Committee believe, grain is always dealt with in bulk, and of preventing the trouble and inconvenience of dealing with and identifying individual lots. It has obviously many advantages—the railway certificates, with quantity and grade assured become negotiable commodities; and this alone must greatly facilitate trade.

Perhaps some years hence, when the Indian grain trade has been more developed, a system of the same kind might be found convenient and desirable in India; but, in the opinion of the Chamber, the time for it has not yet come. It is a system that can only be brought about gradually, and any attempts to force it must fail. The railway companies, moreover, would have to undertake storage and to be ready to deliver, not necessarily any particular grain but a particular "grade" of grain, on production of certificates.

Dated Rangoon, the 30th January 1878.

From—J. CAMELL, Esq., Secretary to the Rangoon Chamber of Commerce,

To—The Under-Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to Resolution of the Government of India No. 3-203, dated 24th August, I have the honour by direction of the Committee of this Chamber, to inform you that rules such as those in force in the United States for the inspection and grading of wheat and other grain are inapplicable to the grain trade of this Province in its present state.

Dated Kurrachee, the 26th October 1877.

From—G. T. PORTLOCK, Esq., Secretary to the Kurrachee Chamber of Commerce,

To—The Under-Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

I have the honour to acknowledge due receipt of your No. 3-204, forwarding a Summary of the Rules for the inspection of grain in the United States, and inviting the opinion of the Chamber as to the desirability of a similar system in India.

In reply, I am desired by the Managing Committee to inform you that, although the members would be glad to see an improvement in the quality of Indian-grown wheat, they are mainly of opinion that, owing to vast and numerous differences between the grain trade as conducted here and in the United States, the American system of storing and grading wheat is altogether impracticable for Kurrachee; and they are not prepared at present to recommend any special legislation for the purpose.

Extract from the Proceedings of the Government of India in the Home, Revenue and Agricultural Department,—No. 6—228-244, *dated Simla, the* 30*th August* 1879.

Read the following papers relating to the question of the adoption in India of the system of inspection and grading of wheat and other grains:—

Despatch from the Secretary of State for India, No. 35, dated the 8th March 1877, and enclosures.

Resolution recorded in the Department of Revenue, Agriculture and Commerce, No. 3—189-204, dated the 24th August 1877.

Read also the following replies to the above Resolution :—

Letter from the Government of Madras, No. 235, dated the 14th February 1878, and enclosures.

Letter from the Government of Bombay, No. 1729, dated the 31st March 1879, and enclosures.

Letter from the Bombay Chamber of Commerce, dated the 24th October 1877.

Letter from the Kurrachee Chamber of Commerce, dated the 26th October 1877.

Letter from the Government of Bengal, No. 1672, dated the 2nd May 1878.

Letter from the Bengal Chamber of Commerce, dated the 23rd January 1878.

Letter from the Government of the North-Western Provinces and Oudh, No. 1571A., dated the 8th June 1878, and enclosures.

Letter from the Government of the North-Western Provinces and Oudh, No. 2085A., dated the 17th July 1878, and enclosure.

Letter from the Government of the Punjab, No. 460, dated the 8th April 1879, and enclosures.

Letter from the Chief Commissioner of the Central Provinces, No. 249-169, dated the 21st January 1878.

Letter from the Chief Commissioner of British Burma, No. 756-35, dated the 28th April 1878.

Letter from the Rangoon Chamber of Commerce, dated the 30th January 1878.

Letter from the Chief Commissioner of Assam, No. 3108, dated the 28th September 1877.

Letter from the Chief Commissioner of Mysore, No. 1247-16, dated the 17th May 1878.

Letter from the Resident at Hyderabad, No. 34B., dated the 6th February 1878.

Letter from the Chief Commissioner of Ajmere, No. 83, dated the 5th February 1878.

RESOLUTION.

OBSERVATIONS.—In March 1877 Her Majesty's Secretary of State forwarded papers regarding the inspection and grading of wheat and other grains in the United States, and a summary of the rules in force at New York, Milwaukee, Chicago and in the Illinois State generally was circulated to the Local Governments and Administrations and the Chambers of Commerce in the following August. These authorities were asked to consider whether any system similar to that embodied in the rules could be adopted in this country; and if so, to suggest the manner in which Government could aid in its introduction, whether by legislation or otherwise. Their replies have now been received, and perused by the Governor General in Council.

2. Of the four sets of American rules, the most detailed are those of New York and of the Illinois State. Between these there is a marked difference, the former being based on agreements between the

New York Produce Exchange and various Railway Companies, and the latter deriving their force from Acts of the Legislature. But the general object of all the rules, as correctly asserted by the Bombay Chamber of Commerce, is not to improve the quality of grain, but to facilitate transactions in enormous masses of produce. The Railway Company or the warehouseman, as the case may be, gives the owner of a consignment a receipt for grain of a known standard; and, confidence in the classification being complete, this receipt is as negotiable as a bank-note, and the trouble and inconvenience of dealing with individual lots of grain are prevented; the result being that whoever becomes the holder of the receipt has merely to apply to the Railway Company or the warehouse for the delivery of a parcel of wheat of the quantity and quality stated. Such a system could obviously only arise in large commercial centres on which the grain supplies of vast areas were concentrated, where produce was always bought and sold in bulk, and where trade, both in point of mutual trust amongst merchants and of magnitude, was very highly developed.

3. The Indian export trade in grain, to which alone any such system as is above described would apply, is insignificant compared with that of America, as will appear from the figures given in the margin. And looking to the origin and nature of the rules, it is not perhaps surprising to find a general consensus of opinion that they are at present far in advance of the requirements of this country.

Exports of grain (excluding rice) from India and America from 1876 to 1879—

	From India.	
In 1876-77	314,496	tons.
1877-78	360,997	„
1878-79	82,360	„
	From the United States.	
In 1876-77	2,679,778	tons.
1877-78	2,866,643	„
1878-79	4,187,567	„

Note.—These figures represent the conversion of bushels into tons and wheat—flour and meal are omitted.

4. The Government of Madras, concurring with the Board of Revenue, consider that the American system is not likely to prove feasible in that presidency. The Lieutenant-Governor of Bengal reports that all the officers under his government who have been consulted on the subject are agreed that the system is unsuited to the present state of the trade and the character of the people of this country. The opinion of the Government of the North-Western Provinces is to the like effect. In Burma the export trade is in rice, to which the rules are admitted to be inapplicable. In Assam no wheat is grown. In Mysore and Ajmere the rules could not, it appears, be introduced with any practical advantage. The Punjab Government have expressed no opinion, but have transmitted a report of the Financial Commissioner, in which, whilst admitting the utility of the system in a highly-civilised commercial community, he doubts its usefulness in the interior of India. The Government of Bombay remark that the grain-trade may there be said to be as yet in its infancy, and that it has few facilities for expansion. They think it would be oppressed, if not ruined, by the burden of inspection; and they add that there is reason to believe that this work would be unpopular and provocative of suspicion and opposition. The Resident at Hyderabad, concurring with the Commissioner of the Assigned Districts, regards

the trade of Berar as too undeveloped for the adoption of such a scheme as that under consideration; but he further remarks that, were it initiated by an association of grain merchants at the chief seaport towns, the result might perhaps be found to be beneficial both to the merchants themselves and to the country generally. Till the want is felt by those directly interested, he doubts the advantage of State aid or interference. The Chief Commissioner of the Central Provinces, accepting the views unanimously held by those whose advice he has asked, looks on the American system as too advanced for the present circumstances of the country, and believes that an attempt on the part of Government to introduce it would be misunderstood and viewed with suspicion. At the same time, he asks for a copy of the Illinois Rules and Acts, not as being now useful for adoption, but because the plan in operation in that State seems, more nearly than any other, to approach to what might hereafter prove acceptable in the Provinces he administers.

5. The different Chambers of Commerce express views of the same tenor as those of the Local Governments. The Madras Chamber observe that its members are not engaged in the grain trade in the interior, and could exercise no influence over dealers in the matter. The opinion of the Bombay Chamber is that the time for arrangements like those in America has not yet come, that they could only be introduced gradually, and that attempts to force them on would fail. At Kurrachee the storing and grading of wheat, as in the United States, is regarded as altogether impracticable. The Rangoon Chamber think the rules would not apply. The Bengal Chamber of Commerce, having regard to the essential differences between the circumstances and course of the grain in India and America, give the same opinion as the Kurrachee Chamber, namely, that it would be impracticable to assimilate the system of this country to that of the United States.

6. On consideration of the reports above summarised, it is evident to the Governor General in Council that arrangements and rules such as obtain at the centres of the American wheat trade are not suited to the present condition of Indian trade. No further action on the part of Government is at present either necessary or desirable. The case is not now one for any intervention by the State; and although the diffusion of information on the subject may have had its use in view of the possibilities of future commercial development, it is, in His Excellency's opinion, obvious that measures in the direction of establishing such a system as that which prevails in America should be initiated, if at all, by the trading public when they feel the need of it. For the present the course of trade will best be left to those channels in which it normally flows, in the belief that Indian merchants and dealers will spontaneously resort to those expedients for facilitating the interchange of commodities which are best adapted to the circumstances of the country. The question of inspecting wheat for the purpose of ensuring the good quality of Indian exports in that staple is, of course, distinct from what is now under discussion.

ORDER.—Ordered, that copy of this Resolution be forwarded for information to the Local Governments and Administrations and Chambers

of Commerce consulted, together with a copy of the replies to the Resolution of 24th August 1877, read in the preamble.

Also that a copy of the "Railroad and Warehouse Laws of Illinois" be forwarded to the Chief Commissioner of the Central Provinces, with reference to his request for further information.

Also that copy of the Resolution be transmitted to the Secretary of State.

No. 14, dated Simla, the 22nd September 1879.

From—The Government of India,

To—Her Majesty's Secretary of State for India.

Referring to the despatch of Your Lordship's predecessor, No. 35, dated the 8th March 1877, we have the honour to forward for information a copy of the Resolution noted in the margin, on the question of the introduction into India of a system for the inspection and grading of wheat and other grains.

No. 6—228-244, dated the 30th August 1879.

2. The unanimous opinion of all the authorities who were consulted on the subject is, that the trade of India in grain is not sufficiently advanced to admit of the adoption of such a scheme; and we have accordingly decided not to take any action at present in the matter.

3. We will address Your Lordship in due course on the subject of the measures to be adopted for improving the quality of Indian wheat with reference to the despatches marginally noted.

No. 130 (Statistics and Commerce), dated the 21st December 1876.

No. 14 (Statistics and Commerce), dated the 18th January 1877.

No. 2, dated India Office, London, the 10th January 1878.

From—Her Majesty's Secretary of State for India,

To—The Government of India.

I transmit, for the information of Your Excellency, a copy of two letters addressed by Mr. John Head, of the firm of Ransomes, Sims & Head, Agricultural Engineers, to Mr. R. W. Crawford on the 23rd of November, and to Dr. Forbes Watson on the 18th of December, containing suggestions regarding the employment of steam-threshing machines for the development of the trade in wheat in India.

2. In order that any such experiment, as is proposed, might be attended with success, it would be necessary to select localities in the centre of wheat-producing tracts where the machine might be exhibited to as large a number of agriculturists as possible.

3. If your Government should be of opinion that it is desirable to obtain any such machines, it must be remembered that it would probably be necessary to engage the services of a skilled mechanic to take charge of each machine, in which case it must be stated for how long a time his services should be engaged.

Dated Ipswich, the 23rd November 1877.

Demi-official from—JOHN HEAD, Esq.,

To—R. W. CRAWFORD, Esq.

Your kind reception of me last week encourages me to send you on paper a few ideas upon the development of the export grain trade in India—a subject to which I have turned my attention for some time past.

Until within the last few years our chief supplies of grain came from Russia, Hungary and the Danubian Provinces, and but little from the United States of America. This country, however, by the improvement of its railway and water communications has entered into competition so vigorously with the European markets as seriously to injure their trade, besides which India and the Colonies of New Zealand and Australia have lately supplied us with large quantities of good wheat. It appears to me that, owing to the paralysed state of all the countries in the east of Europe, it will take many years before they can regain their position in the competitive race for the supply of the western markets with corn; and it must certainly be to the advantage of England to encourage as much as possible the trade in grain with her own Colonies and India, and especially the latter country, because, by so doing, she is paying her debts with the products of the mother-country, besides enriching her own possessions; whilst in dealing with America, Russia, &c., payments must be made in gold, which conduces to the prosperity of countries which endeavour to shut out our manufactures from their markets by the imposition of protective duties.

It is well known that all grain-producing countries which have begun to export their produce have done so under great difficulties at the outset. I remember in Russia in 1861 that the crop was threshed by horses or bullocks, transported in bullock-carts to the port of Odéssa, and shipped to England generally by sailing vessels, arriving at their destination about 10 to 12 months after the harvest; whilst at the present time the crop is threshed by steam-machinery and transported by railway to the nearest port, screw steamers carry it to Falmouth or Marseilles, and the bulk is usually delivered in from four to five months from the time it was growing on the steppes.

In India arrangements exist for cheap and rapid railway transport equal, if not superior, to those of any of the countries in the east of Europe or America; but the farmer is sadly behind his European competitors in preparing his grain for the market after harvest. He now threshes his crop by oxen and winnows with the wind, entailing a loss of from 10 per cent. to 15 per cent., besides which the threshed corn and straw for fodder are delivered in a very dirty state, and the whole operation takes a very long time to perform.

If steam-threshing machines could be employed to go from village to village to thresh the grain at the rate of from 400 to 600 bushels per diem for each machine, the wheat could be delivered in bags in a clean state, fit for immediate exportation, with a loss of not more than 2 to 3 per cent. of the whole crop; and I estimate that a crop threshed by steam could be forwarded to the nearest railway station in about one-fourth of the time which the present tedious and wasteful system requires. One great advantage of the employment of steam power, is that it enables the zamindars and small farmers to receive payment for their produce much more rapidly than at present, and the merchant would be able to make his calculations with far greater accuracy, and to turn over his capital in a shorter time, than under the present system.

I should propose to employ threshing machines specially adapted for hot countries, which not only thresh the grain and clean it for the

market, but which chop and bruise the straw so as to render it fit for fodder for the cattle at one and the same time. The latter operation is necessary in all hot countries where hay is not grown; and the cattle are fed on the straw, which contains a much larger amount of silica and saccharine matter than in cold countries, and cannot be cut up by means of the ordinary chaff-cutter, which only slices the straw into short cylindrical pieces, and does not soften and bruise it, which would destroy the palates of the animals with their sharp edges, if fed on fodder prepared in this way. I should also employ a light engine on four wheels which could be easily transported from place to place with from four to six bullocks; and as these engines would use only *refuse straw* as fuel at the rate of about eight sheaves for every 100 sheaves threshed, the cost of threshing by steam-power would be actually much less than when oxen are used for the same purpose.

The cost of a complete apparatus, with all extra wearing parts necessary, would not exceed £600; and each machine would deliver on an average about 12,000 bushels of grain in a clean condition per month of 24 days. From information I have received, I gather that it would be almost impossible to form an association or company of the small farmers in India to purchase a steam-threshing machine, which could be let out for hire at a fixed rate, and, with a rare exception, the zamindars would not wish to depart from the present custom until it was clearly proved that threshing by steam was the most profitable method which could be employed. Under these circumstances, it appears to me that the only plan for introducing steam-threshing machinery into India would be for the Government to purchase three or four sets of machinery, and plant them in some of the centres of the corn-growing districts, and for the first year to thresh the wheat at a mere nominal sum per quarter. The advantages would soon be apparent, and probably the machines would find purchasers in the locality before the next harvest.

Much has been said against the introduction of agricultural machinery into India. Government has tried model farms, and they have been failures in many instances, because too great changes in agricultural operations have been attempted. I do not propose to introduce new ploughs, reaping machines, or other similar machinery at present into the corn-growing districts of India, or to interfere in any way with the native system of the cultivation of the soil or the harvesting of the crops, but to commence by dealing with that part of the question which affects the success of India as a corn-exporting country in competition with other nations, *viz.*, the adoption of the most rapid and cheapest method of bringing the grain grown in India into the consuming markets. When we look around at the increasing demand for steam-power for irrigation, for working the machinery at the tea and indigo factories, and also for many other purposes throughout India, I do not see why it cannot be introduced for agricultural purposes, and why eventually the same system of preparing the crops for the market could not be adopted in India, as in the east of Europe and in America.

I should be glad if you could assist me to bring these views before those who are interested in this most important question; and thanking you in advance.

Dated Orwell Works, Ipswich, the 18th December 1877.

Demi-official from—JOHN HEAD, Esq.,
To—Dr. FORBES WATSON.

Referring to my interview with you last Friday, I have now the pleasure to forward you some more detailed information, respecting the threshing machinery which would be suitable for India.

As you are probably aware, we make two classes of threshing machinery, in one of which the grain is threshed and the *straw chopped* and *bruised* in one and the same operation, whilst in the other system the grain is threshed, but the straw is delivered *long* and *unbroken*, in the same way as in England and all other cold countries where straw is not used for fodder, but required for litter, manure and industrial purposes. As I suppose the wheat in Northern India is very similar to that in Spain, South Italy and Chili, we should recommend one of our steam-threshing machines as arranged for these countries. The enclosed photographs will give you an idea of the general appearance of the machine, which delivers the clean grain into baskets placed on the ground between the wheels, whilst the chopped straw passing over the sieve in the front of the machine (which extracts any grain which may possibly be left in it and also cleans it from dust) falls in the front. If the grain should be very dirty and much mixed with foreign substances, it is advisable to pass it through a winnowing machine before putting it into the sacks for conveyance to the railway; and we should propose to place one of these machines between the steam engine and the threshing machine through which the grain would be passed after leaving the large threshing machine, and which would render it completely free from any impurities whatsoever. This arrangement would be more simple and more easily understood by the natives, and the threshing machine would not be so heavy or so complicated. The tracing enclosed shows the proper positions of the workmen; and although we have only included 11 workmen for the whole staff, you would probably require a larger number in order to keep the machine in full work. I do not know exactly how the grain would be brought to the machine; but in Spain and Italy it is usually brought alongside in carts, and pitchforks are used to place it on the top of the machine, and I would suggest that one or two dozen pitchforks should be sent out with each machine. The chopped straw is dragged away by bullocks attached to a pole, at the end of which is a large flat piece of wood which gathers the straw as it goes along.

The weight of the threshing machine in its working state, when drawn about from one place to another, would be a little over 4 tons; but when necessary to transport it long distances, it may easily be lightened by taking out the chopping cylinders. The engine would weigh rather more than five tons; but this could also be lightened if necessary. Both engine and threshing machine would be fitted with wrought-iron wheels. The extreme width* over the two wheels of the engine is 6 feet 6 inches, and over the wheels of the threshing machine 7 feet 10 inches. With respect to the power required to draw this machinery

* The width of both engine and machine wheels is 7 inches.

about, much depends upon the state of the road; and in Europe from two to three pairs of bullocks for each machine are usually sufficient on any ordinary road.

I enclose you an estimate for a complete set of the machinery recommended—the machine fitted with apparatus for chopping and bruising the straw; but in case your friends would wish for a machine which delivers the *straw straight*, I would suggest that a *small* machine, 4 feet (wide) drum, should be added as an experiment, and we have therefore given you the price of such a machine: it could be worked by the same engine. I should like to remark, however, that with the smaller machine it would be found somewhat difficult to bruise and macerate the straw, as the straw in hot countries contains a much larger amount of silica and woody fibre than in cold climates, and consequently cannot be cut up with an ordinary chaff-cutter.

With regard to sending out a workman to take charge of each machine, we think we could find a thoroughly competent mechanic for £20 per month, the Government finding him in board and lodging, and paying his passage out and home.

I cannot tell exactly the cost of freight on an engine and threshing machine similar to those described *viâ* Suez Canal, but should say it would be somewhere about £85.

Any further information is always at your service.

P.S.—I have sent in an envelope a sample of the straw as chopped by the machine.

Estimate of cost of machinery for threshing grain for India.	£	*s.*	*d.*
1 M. 1. Steam-threshing and straw-chopping machine with 4 ft. 6 in., 8 beater, drum, all usual accessories and wrought-iron road wheels	225	0	0
1 set of additional wearing parts	34	15	0
1 main driving strap, 70″ × 7″	*Gratis.*		
1 extra driving strap	14	0	0
Packing	13	10	0
1 8-HP. patent straw-burning engine (Head and Schemioth's patent), with all usual accessories and wrought-iron road wheels	280	0	0
1 set of additional wearing parts	16	10	0
Packing	10	10	0
1 improved winnowing machine, with transmission and pulley to engine, packed	20	0	0
	£614	5	0

N.B.—If the threshing machine is made of teak, the cost would be £50 extra.

	£	s.	d.
1 B. 9 steam-threshing machine, with 4 ft., 8 beater drum, all usual accessories, and wrought-iron wheels ...	140	0	0
1 complete set of extras	13	10	0
Packing	10	0	0
	163	10	0

N.B.—If the threshing machine is made of teak, the cost would be £50 extra.

IPSWICH; *The 18th December* 1877. } RANSOMES, SIMS & HEAD.

No. 62, dated Calcutta, the 20th February 1878.

From—G. H. M. BATTEN, Esq., Offg. Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce,

To—The Secretary to the Government of Madras.

I am directed to forward the accompanying copy of a despatch from the Secretary of State dated the 10th ultimo, No. 2 (Statistics and Commerce), and of the letters from Mr. John Head therein referred to, and to request that the Government of India may be favoured with any remarks which the Superintendent of the Government Farms at Sydapet may have to offer on the proposal to import for employment in this country steam-threshing machines with a view to the development of the Indian trade in wheat.

Nos. 63-64, dated Calcutta, the 21st February 1878.

From—G. H. M. BATTEN, Esq., Offg. Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce,

To—The Secy. to the Govt., N. W. Provinces and Oudh, and Chief Commissioner, Central Provinces.

I am directed to forward the accompanying copy of a despatch from the Secretary of State dated the 10th ultimo, No. 2 (Statistics and Commerce), and of the letters from Mr. John Head therein referred to, and to request that the Government of India may be favoured with any remarks which His Honour the Lieutenant-Governor and Chief Commissioner may have to offer on the proposal to import for employment in this country steam-threshing machines with a view to the development of the Indian trade in wheat.

No. 841A., dated Allahabad, the 3rd April 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to your letter No. 63, dated the 21st February last, I am directed to submit, for the information of His Excellency the Governor General in Council, a copy of the papers marginally noted, from which it will be

From Director of Agriculture and Commerce, North-Western Provinces and Oudh No. $\frac{375}{CLXI,}$ dated the 24th March last.

To Director of Agriculture and Commerce, North-Western Provinces and Oudh, No. 840A. of this day's date.

seen that the Lieutenant-Governor has approved Mr. Buck's proposal to postpone, till the 1st August next, his report on the question of importing steam-threshing machines into this country.

No. 375-CLXI, dated Allahabad, the 24th March 1878.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government of the North-Western Provinces and Oudh.

I have the honour to acknowledge the receipt of your letter No. 597A., dated 5th instant.

2. I request permission to postpone a full report on this subject till the 1st of August on my return from leave. Meanwhile I will circulate the papers for the opinion of planters or practical agriculturists.

3. I question very much whether any project which involves the enforced idleness of cattle by the substitution of other labour, however cheap, is likely to be remunerative; nor does it appear desirable to encourage a system which lessens the supply of cattle-fodder.

4. The machine could not be utilised this season; and I believe therefore that, if my report is submitted on the 1st of August, there will be ample time to effect any arrangements which may be required.

No. 840A., dated Allahabad, the 3rd April 1878.

From—C. ROBERTSON, Esq., Secretary to the Government of the North-Western Provinces and Oudh,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

With reference to your letter No. 375-CLXI, dated the 24th March, I am directed to state that the Lieutenant-Governor approves your proposal to postpone till the 1st August next the report called for by the Government of India on the advisability of importing steam-threshing machines for employment in this country.

No. 1201-54, dated Nagpur, the 2nd April 1878.

From—L. FRASER, Esq., Secretary to the Chief Commissioner, Central Provinces,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In reply to your letter No. 64, dated 21st February last, with accompaniments, on the subject of steam-threshing machines, I am directed by the Chief Commissioner to forward copy of a letter No. 39, dated 18th ultimo, from the Superintendent, Nagpur Model Farm, and to say that Mr. Morris concurs generally in the views expressed by Captain MacDougall.

No. 39, dated the 18th March 1878.

From—Captain J. W. MacDougall, Supdt., Model Farm, Nagpur,
To—The Secretary to the Chief Commissioner, Central Provinces.

With reference to your office No. 886-40 of 12th March, requesting expression of opinion with respect to the matters treated of in the enclosure accompanying your letter, I have the honour to reply as follows.

1. The success of a portable steam engine, with portable thresher, depends, in my opinion, wholly on the facility with which it could travel over village roads and unbridged streams. The weights given by Mr. Head in his letter of the 18th December 1877 for each machine suggest the probability of such machines progressing very slowly over the country, while the great width between wheels at once unsuits them for ordinary country tracks in these parts. Then, as the utility of these machines depends entirely on easy locomotion, I doubt our present class of village cattle being able, harnessed at say 6 to 8 pairs for each machine, to travel very fast across-country.

2. That the thresher would do all that is said of it, and be of very great advantage in placing a well-cleaned wheat in the market, cannot be doubted; but I question the probability of a ryot ever troubling himself to bring his wheat any distance to be threshed. As the moving of such large machines about the country would be a very tedious, besides expensive, operation, we would be obliged to make both machines stationary in the centre of a group of villages. The diameter of the village circle cannot well be under four miles; and to carry his grain two miles to be threshed, and carted back again, would be an extravagant idea to the ryot, who so easily prepares his threshing-floor in the field where the crop is grown.

3. I think that, unless the firm of Ransomes, Sims & Head can reduce the weight of their machines, or, better still, fit up their engine both as a traction as well as motive power one, no advantage would be gained by importing into these Provinces either machine.

Extract from the Proceedings of the Government of Madras in the Revenue Department,—No. 751, *dated* 16*th May* 1878.

Read the following papers:—

Proceedings of the Board of Revenue, dated 17th April 1878, No. 1069.

Read the following—

No. 297, dated Sydapet, the 30th March 1878.

From—W. R. Robertson, Esq., M.R.A.C., Superintendent, Government Farms, Sydapet,

To—The Acting Secretary to the Board of Revenue, Madras.

In compliance with G. O. No. 313 of the 27th of February last, I have the honour to submit the following remarks regarding the proposals made by Mr. John Head in his letters, dated the 23rd of November and the 18th of December of last year, printed with the before-mentioned order to introduce steam-threshing machinery into India in view to the further development of the export trade in wheat.

2. Mr. Head proposes to introduce steam-threshing machinery *for threshing wheat only*. European threshing machines being especially constructed for threshing this and other corn crops of Europe, this proposal is not open to the objections raised hitherto in this country against the introduction of English threshing machinery; for until now such proposals have always contemplated the threshing of our *ordinary* grain crops by these machines, for which purpose, as now constructed, they are quite unfitted. No more difficulties would be likely to be experienced in threshing by machinery a crop of Indian-grown wheat than in threshing by similar means a crop of wheat raised in England.

3. However, the adaptability of threshing machines for threshing crops of Indian wheat is not the only point to be considered. There are other questions of equal importance that require to be answered. Amongst these, the following:—

(1) Will it be possible to move the threshing machinery from village to village under existing circumstances?

(2) Can our agriculture afford to lose 10 per cent. of the straw of the wheat crop?

(3) Would steam-driven threshing machinery be likely in the rural districts to perform the work needed at a less expense than the ryot now incurs?

4. I will endeavour to answer these questions from such information as I possess regarding the condition and circumstances under which agriculture is practised in this presidency. I do not apprehend that there is any material difference between the state of matters of this nature in this presidency and in other parts of India in which wheat is more extensively cultivated. I may observe here, however, that wheat is grown to a very limited extent in this presidency. In an average year it occupies only about 19,000 acres of the 21,000,000 acres cropped; and it is met with only in small plots scattered over a considerable area of country.

5. *Will it be possible to move the threshing machinery from village to village under existing circumstances?*—The weight of the threshing machine and engine it is proposed to employ would be between nine and ten tons. Mr. Head says that on an ordinary road two to three pairs of bullocks would draw each machine.* It is presumed that he refers to the draught bullocks usually employed in Europe, the live weight of which on the average is certainly five times as great as that of the ordinary draught bullocks of this country. Assuming that this is so, and that the draught-power of cattle bears a close relation to their weight, it follows that from twenty to thirty, or say twenty-five pairs of bullocks, would be needed to draw the machinery. But Mr. Head refers to an *ordinary* road. In this presidency, except in the main lines of traffic and in and around the chief towns, the roads cannot be deemed *ordinary* roads in the sense understood by Mr. Head; and this presidency is perhaps as well off as regards good roads as any other part of British India. There would perhaps be no difficulty in drawing the machinery along these main roads; but they have generally been constructed in view to secure the shortest and best line between places of

* One engine and one threshing machine.

importance, and not with special regard to the wants of the country through which they pass. Hence it but seldom happens that any but the largest villages and towns are approached by these roads. In many parts of the country the villages are frequently situated miles away from these roads, between which and these villages there is frequently nothing more than tracks fit for pack-animals and pedestrians. Metalled secondary roads are met with in the more thickly populated parts of the country, but more frequently these secondary roads consist of nothing more than a cart track, the line of which is seldom fixed with any degree of permanence. Along these roads it is difficult to drive any vehicle other than an ordinary native cart; and at certain seasons and in certain parts of the country it is difficult to get even these carts along the roads when moderately loaded. It would thus appear to be impracticable to move the threshing machinery from village to village except by incurring an enormous expenditure; and that, if these machines were introduced, they should be drawn along the principal metalled roads only. This would involve the selection of centres along these lines of roads to which the unthreshed grain could be brought and the threshing operations performed. In some localities the position of these roads might be convenient for the foregoing arrangement; but I fear generally the arrangement would necessitate long cartages, and frequently over very bad roads, which would be likely to prevent ryots from bringing their produce to these threshing centres.

6. *Can our agriculture afford to lose* 10 *per cent. of the straw of the wheat crop?*—In almost all parts of India there is during several months in the year a great dearth of cattle-food. The great want of India is *more stock* and *better-fed stock*. It is true that straw is but a poor food; yet it nevertheless forms the chief food of the draught cattle of this country, and will continue to do so until the ryot can be induced to grow fodder crops. If agriculture was practised as it ought to be, the loss of 10 per cent. of the wheat straw by its use as fuel would not be a matter of any moment; for it would be so easy to replace the loss by raising fodder crops, or by better tillage and manuring to make the crops yield 10 per cent. more of straw. Assuming that there would be no special effort to make up the loss of the straw that would be used as fuel, it becomes necessary to determine what this loss would amount to. It appears that to raise steam in one of the straw-burning engines 25lbs. of straw per horse-power per hour is consumed. In other words, for an engine of the size mentioned by Mr. Head, about one ton of straw would be consumed per working day, or 100 tons in a working season of five months. This is not a great quantity of straw to lose for each engine employed, seeing that such a considerable quantity would be threshed in the period mentioned. Indeed, it is more than probable that in threshing out the same quantity by means of cattle in the usual way, they would consume a larger quantity than the engine; but the straw consumed by the engine is so much dead loss as regards the providing of food for the stock of the country. It is true that wheat straw is not generally much appreciated by ryots as fodder; but their necessities are often great, and at such times they are glad to get anything that will but keep their stock alive. In most parts of India straw is a much

esteemed produce, and frequently is sold at very high prices—indeed quite as high as in England. It is but rare indeed in this country that straw is looked upon as a refuse to be got rid of by any means, as apparently was the case in so many parts of Southern Russia at the time when the straw-burning engine was introduced there. The engines could use as fuel vegetable refuse not adapted for use in feeding stock; but in India fuel is frequently as scarce as fodder, and in most parts every particle of vegetable refuse is carefully collected for use as fuel. On the whole, however, I am of the opinion that the loss of the straw that would be used by the straw-burning engines would not be a matter of serious importance.

7. *Would steam-driven threshing machinery be likely in the rural districts to perform the work needed at a less expense than the ryot now incurs?*—Each set of machinery Mr. Head proposes to introduce would cost, it appears, about Rs. 9,000, delivered in this country; that is, if the threshing machine is made of teak and the usual spare wearing parts are supplied. It is difficult to determine the number of days in the year on which the machine would probably be at work—so much depends upon the part of the country in which it is employed. Usually the cultivators thresh their grain crops very soon after harvest. In this presidency crops are very rarely stacked unthreshed. Over considerable tracts of country heavy rains are due soon after the harvest season. In the absence of proper arrangements for stacking or storing under cover unthreshed crops, the threshing season must necessarily be usually a very short one. Heavy rain would prove highly detrimental to unthreshed wheat stored in the usual careless way. All things considered, then, I am of the opinion that, unless ryots can be induced to stack their unthreshed wheat in properly built stacks, into which the rain cannot readily find access, or to store it under cover, the threshing season over the country generally could not be made to extend over five months in the year, or the machine would actually do a day's work only during 100 days in the year; and even this would only be when the distances to be travelled by the machine are short and the state of the roads generally good. If then the threshing season will consist of only 100 actual working days in the year, it will be necessary to divide over these days the interest on the capital employed and the annual charge for wear and tear. Taking these together at 15 per cent. per annum, this charge will amount to Rs. 1,350, or Rs. 13-8 per working day.

8. The next point to investigate is the cost of fuel. In most parts of India fuel is much more costly than in England; in Madras the ordinary price of Casuarina firewood is Rs. 8 per ton. Estimating that 3½ tons of Casuarina wood is equal for raising steam to one ton of coals, we have Rs. 28 as the cost of producing by wood the amount and force of steam that would be generated by the consumption of one ton of coals; the ordinary selling price of which at the coast in this presidency varies from Rs. 25 to 35 per ton—a price at the least *five times as great as that at which the English farmer generally can buy coals for use in raising steam.* It is true that Mr. Head proposes to use neither coals nor wood for raising steam in the engines to be employed. However, the price of wood regulates the market price of all other descriptions of fuel;

and it would not be less costly probably to use either straw or other vegetable refuse. Valuing coals at Rs. 30 per ton, and assuming that the effective power of straw as fuel in raising steam is one-fifth of that of a similar weight of coals, it follows that the full value of straw would be only Rs. 6 per ton—a price at which in this presidency ryots would but seldom be willing to dispose of their straw. However, for my present purpose, I will value the straw or other vegetable refuse to be used as fuel at Rs. 6 per ton. As one ton of straw would be used per day, the cost would therefore be Rs. 6 per day for fuel.

9. The next item of cost to be determined is labour. Mr. Head says that a competent mechanic to take charge of each machine would expect £20 per month, with board and lodging and his passage paid out and home: the entire cost for the wages, &c., of such a man would be, say, Rs. 300 per mensem. Assuming that he could be profitably employed during the seven months of the year when not employed in threshing, his cost during five months, Rs. 1,500, would have to be charged over 100 working days, making the charge for this man's services Rs. 15 per day. The other labour would be ordinary cooly labour; and for this the daily cost for each working day would not be more than Rs. 3.

10. I have now to determine the cost of moving the machinery from place to place—an item very difficult to arrive at. Assuming that the machinery is placed in a large wheat-producing country, and that convenient centres can be arranged for threshing, necessitating the removal of the machinery say ten miles at intervals of five days, there would be thirty removals in the season of five months; and if twenty-five pairs of cattle are sufficient for removing the machinery, the services of 750 pairs of cattle would be required for one day, the hire of which at 8 annas per pair would represent Rs. 375, which divided over 100 working days would amount to per day a little less than Rs. 4.

11. The foregoing may be summarised as follows :—

	Cost per working day. Rs.	A.	P.
Interest on capital and wear and tear on Rs. 9,000 at 15 per cent. per annum, charged over 100 working days	13	8	0
Cost of fuel	6	0	0
Cost of labour	18	0	0
Cost of removals	4	0	0
Total ...	41	8	0

The total cost would thus amount to Rs. 41-8 per working day. Mr. Head estimates that each machine would thresh and clean for market 500 bushels of wheat per working day. According to the foregoing figures, then, the cost of threshing each bushel of wheat would be Re. 0-1-4.

12. In this presidency agricultural labour is generally paid in kind. For threshing and winnowing wheat the rates paid vary. The average rate is probably something near 7½ per cent. of the grain threshed; but this is for spelt wheat. Common wheat is not grown to any extent in this presidency. Thus, for threshing and winnowing a bushel of this

wheat weighing 55lbs., the payment would be 4lbs.; or, valuing the bushel at Rs. 1-8, the money-value of the grain paid would be Re. 0-1-9. For threshing and winnowing a bushel of common wheat the cost would be about the same. However, if the labour was properly regulated, and the winnowing machine was used, the cost of the work might, I believe, be considerably reduced. Thus, for instance, for threshing and winnowing paddy it is usual for the ryot to pay 5 per cent. of the grain threshed, which would be 2½lbs. of grain for threshing a bushel weighing 50lbs.; or, valuing the bushel at Re. 1, the grain paid for threshing it would be worth about three-quarters of an anna. On the Sydapet Experimental Farm the cost is even less, from the employment there of winnowing machines in preparing paddy for the market. A few days ago at that farm the crop produced on two acres of land, consisting of 14,464lbs. of straw and 3,200lbs. or about 64 bushels of paddy, was threshed and winnowed in one day by six men, whose wages together amounted to Re. 1. In this case *the cost was only quarter of an anna per bushel.*

13. Mr. Head asserts that the threshing machine will remove from 10 to 15 per cent. of the grain which, he says, is left in the straw when threshed in the ordinary way. It is true that there is often a good deal of waste when the grain is threshed out by the treading of cattle; but there is no reason why the flail should not be used instead, and this will get out the grain almost as effectually as the threshing machine can. But with some of our grains, paddy for instance, threshing is perfectly performed by merely raising the sheaf of unthreshed grain, and striking the ear end five or six blows on a log of wood.

14. On the whole, I am of the opinion that at present there is but a very limited field in this country for the employment of steam-threshing machinery, and that, before attempting to introduce steam-threshing machinery, excepting where circumstances are specially favourable to its working, it would be much better to endeavour to induce the ryots to adopt some better arrangements in threshing and in preparing their grain for the market, especially do I think it necessary that they should be advised to use winnowing machines. From the Resolution of the Government of India and the papers to which it refers "on the development of the export trade in Indian wheat" it would appear that the most serious objections made in England to Indian wheat are (1) that it is usually in a very dirty condition; (2) that it is generally very mixed, the sample being formed of several kinds and qualities of wheat; (3) that it is generally mixed with pulses, and frequently with other kinds of grain. I need scarcely say that the use of the threshing machine would not remove these objections. It is true that cleaning or sizing machinery, that is, winnowing or screening machines, could be combined with the threshing machine; but they could equally well be used by themselves, and driven either by manual or cattle power. Such machines would remove the dirt, and they would improve the sample by taking from it all light and inferior grain; but they could not, except to a very limited extent, remove the pulses, and they could do nothing towards separating wheats of different qualities when the grains are similar in size. This last drawback can be remedied only by the selection and

sowing of proper seed and the avoidance of sowing pulses with wheat. I am inclined to believe that it is to an improvement in our agricultural practice rather than to the introduction of steam-threshing machinery that we must look in order to place the export trade in Indian wheat on a sound footing.

Remarks by the Board of Revenue, Madras.

Submitted to Government with reference to the order quoted.

Order thereon by the Government of Madras.

Ordered that the following letter be despatched to the Government of India:—

No. 752, dated Ootacamund, the 16th May 1878.
From—C. G. MASTER, Esq., Secretary to the Government of Madras,
To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In reply to your letter of the 20th February 1878, No. 62, I am directed to forward the accompanying Proceedings of this Government, in which are embodied the remarks of the Superintendent of Government Farms at Sydapet on the proposal to import steam-threshing machines into this country.

Telegram, dated the 10th June 1878.
From—Secretary of State, London,
To—Viceroy, Simla.

Despatch, 10th January, No. 2, Statistics. Steam-threshing machine can for additional £40 be made available for rice. Buck mentions proposal to test one on Captain Chapman's estate. Is this desired? Machine should start early in September.

Telegram, dated the 14th June 1878.
From—Viceroy, Simla,
To—Secretary of State, London.

Your telegram 10th. Have consulted Local Governments as to possibility of utilising steam-threshing machine anywhere in India. Please take no steps till you hear further from us.

No. 111, dated India Office, London, the 6th June 1878.
From—Her Majesty's Secretary of State for India,
To—The Government of India.

With reference to the Marquis of Salisbury's despatch dated the 10th of January last, No. 2, I transmit for your information a copy of a further letter from Mr. Head, regarding the supply of steam-threshing machines for the development of the trade in wheat; and I request to be informed, by telegraph if possible, what are your wishes on the subject.

Dated Orwell Works, Ipswich, the 22nd May 1878.
From—JOHN HEAD, Esq.,
To—The Under-Secretary of State for India.

At the beginning of this year I had the honour of communicating to Her Majesty's Council for India, through Dr. Forbes Watson and Mr.

Crawford, a proposal for improving the method of threshing grain in India by steam, thereby economising the cost of the operation and enabling the farmers to send their grain to the railway for shipment at a much earlier period than by the present system.

I have reason to believe that you were kind enough to send out a despatch with the drawings, and a general explanation of the scheme; and I venture to write again to you on the subject, bringing before your notice the importance of coming to a decision at an early date.

As it will be necessary that the machinery should arrive in Calcutta not later than the beginning of November, and I should especially like to have ample time to construct the two or three machines which the Government may possibly decide to order, it would be necessary, in order that they might be ready for the present harvest, to commence their manufacture during the month of August.

In dealing with all matters connected with agriculture, of course it is necessary to be prepared for all operations according to the season at which the crops ripen; and unless the Government could make an experiment during the next harvest, a year of valuable time would be lost. May I therefore venture to ask you to communicate with the Government of India, so that a reply might be received with the least possible delay (if possible by telegraph), so that the machinery may be constructed in the most perfect way, and in ample time for shipment to Calcutta for next season.

Telegram, dated the 8th July 1878.
From—Viceroy, Simla,
To—Secretary of State, London.

Your despatch 6th ultimo, No. 111, Commerce. Steam-threshing machines not required. Despatch follows.

No. 14, dated Simla, the 22nd July 1878.
From—The Government of India,
To—Her Majesty's Secretary of State for India.

We have the honour to acknowledge the receipt of Lord Salisbury's despatch dated the 10th January last, No. 2 (Statistics and Commerce), and of its enclosures, transmitting a suggestion made by Mr. John Head, of the Firm of Ransomes, Sims & Head, Agricultural Engineers, that steam-threshing machines should be employed in this country with a view to the development of the Indian trade in wheat.

2. In reply, we beg to forward copy of the letters marginally noted from the Governments of Madras and of the North-Western Provinces and Oudh and from the Chief Commissioner of the Central Provinces, from which it will be seen that all the authorities consulted express an opinion adverse to the proposal.

From the Government of Madras, No. 752, dated the 16th May 1878, and enclosure.
From the Government of the North-Western Provinces and Oudh, No. 841A., dated the 3rd April 1878, and enclosure.
From the Chief Commissioner of the Central Provinces, No. 1201-54, dated the 2nd April 1878, and enclosure.

3. Mr. Head states that the cost of one machine and engine, &c., would be—

	£	s.	d.
Price of machine and engine	777	15	0
Freight	85	0	0
	862	15	0
Wages of a mechanic for two years @ £200 a year	400	0	0
Cost of board and lodging for mechanic @ (say) £100 a year	200	0	0
Total ...	1,462	15	0

The total charge for one engine and machine and a mechanic for two years would thus be £1,462-15. To this would have to be added charges for native helpers, repair and carriage of machine and engine and other contingencies; and the total charges would certainly not be less than £2,000 for each machine.

4. Mr. Robertson's clear and excellent report, confirmed by the experience of the Superintendent of the Model Farm at Nagpur in the Central Provinces, appears to us to show conclusively that it would be impossible, under present circumstances, to employ such a machine profitably in this country; and we do not believe that in any near future it will ever become profitable to do so. To the reasons so forcibly stated by Mr. Robertson, it may be added that each cultivator now employs his cattle and his labour on threshing his crops at a season when, if not so employed, they would have no work to do; consequently threshing at present costs him nothing. However cheaply a machine might be worked, it would still cost something to use it, which would thus be an addition to the charges at present falling on the cultivator.

5. We are obliged therefore to express our opinion that the proposal to introduce steam-threshing machinery into India, even as a tentative measure, would be premature; and that, under the agricultural conditions of the country and the existing means of internal communications, the plan could not be worked by Government, except at a great loss. If, as a result of the growing trade in Indian wheat, European capital is ever embarked to any considerable extent in the production or preparation for the market of that grain, it may hereafter be found expedient by private capitalists to use steam-threshing (and other) machines; but until that time arrives, no cultivator will be found willing to *pay* for having his wheat threshed when he can thresh it himself at no cost.

6. Holding these views, we addressed to Your Lordship on the 8th instant a telegram (as requested in your despatch No. 111, dated the 6th June), of which a copy is given on the margin.

"Your despatch 6th ultimo, No. 111, Commerce. Steam-threshing machines are not required. Despatch follows."

7. In your telegram of the 10th ultimo mention is made of a proposal to test such a machine, which, at an additional cost of £40,

could be adapted to the husking of rice on Captain Chapman's estate near Allahabad. This suggestion is made at the instance of Mr. Buck, the Director of the Department of Agriculture and Commerce in the North-Western Provinces, who was till recently on leave in England. It will be noticed from the reply of the Government of the North-Western Provinces that Mr. Buck in March last, though entertaining certain objections to the scheme, desired to postpone his final report on the employment of steam-threshing machines in this country till the 1st August; and we deem it advisable to defer an expression of our opinion upon this particular reference in its application to Captain Chapman's farm till we have received Mr. Buck's report.

No. 115, dated India Office, London, the 27th June 1878.

From—Her Majesty's Secretary of State for India,
To—The Government of India.

In continuation of my despatch of the 6th instant, No. 111, I forward a copy of a further letter from Messrs. Ransomes, Sims & Head, dated the 6th of June, with its enclosure from Mr. Buck, the Director of Agriculture and Commerce in the North-Western Provinces, and also of a telegram which I addressed to you on the 10th instant, regarding the proposal to try a steam-threshing machine for wheat and other crops in India.

2. Your Excellency's telegram of the 14th instant having been received, the purport has been communicated to Messrs. Ransomes, Sims & Head.

Dated Orwell Works, Ipswich, the 6th June 1878.

From—Messrs. Ransomes, Sims & Head,
To—The Under-Secretary of State for India.

Referring to our last letter, proposing that you should communicate with the Government in India respecting the completion of the steam-threshing machinery which it is proposed to try for threshing grain crops in India, we have since received a letter from Captain F. C. Chapman of Allahabad, stating that he has been applied to by Mr. Buck, the Director of Agriculture and Commerce of the North-Western Provinces, asking whether he will make experiments with the steam-threshing machinery on behalf of the Indian Government at his estate, known as "Betital." Captain Chapman informs us that he has expressed his willingness to afford every facility to the Indian Government for making the trial of the machine on his estate; and he further writes that his "wheat" crop commences in the month of March, but that the rain or "rice" crops will be ready for threshing in the month of October during the present year, and that he would very much like to have the machinery for threshing these crops, if it is possible. The machinery which we tendered to the Indian Government for threshing grain is also adapted for threshing rice, and many machines are used in Italy for that purpose. A slight addition, at the cost of about £40, is

all that is necessary to render the machinery complete for threshing all the grain crops in India.

Our Mr. Head had an interview on Tuesday with Mr. Buck, the Director of Agriculture and Commerce for the North-Western Provinces, who is now in England, but is returning to India next week; and as he is very much interested in this experiment, he gave Mr. Head a letter embodying his views as to the best course to pursue in order that the machinery might arrive at Captain Chapman's estate in time for the rice harvest; and he wrote out a telegram which he suggested should be sent to the Indian Government in order that instructions might be immediately sent, should they decide to have the machine shipped at the beginning of September.

We venture to forward you this letter and telegram, and trust that you may see fit to communicate with the Indian Government in Calcutta, so that you may receive their instructions for the completion of the machinery.

We may say that, if the engine and threshing machine are shipped in the beginning of September, the Indian Government would be able to have a complete experiment of the utility of steam-threshing machinery for *all their crops*; whereas if it were delayed until the end of the year, they would only be able to form a judgment upon the *wheat* crop.

Waiting the favour of your reply.

Dated London, the 4th June 1878.

Demi-official from—E. C. Buck, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—John Head, Esq.

With reference to your inquiries as to the purchase of a machine (wheat-threshing, &c.) for Captain Chapman, of the North-West Provinces, India, I beg to inform you that the following action was taken before I left India.

A circular letter was forwarded by Government of India to Provincial Governments asking if they could recommend the purchase of your steam-threshing machine for experiment.

I replied, on behalf of the North-West Provinces (Agricultural Department), that I recommended the trial of one of your machines on Captain Chapman's estate, where all the conditions required by you would be more fully satisfied than in any other locality in the North-West Provinces; and I advised the Government to allow a machine to be supplied to Captain Chapman under certain conditions named by me.

I hope that my recommendation will be carried out; but I cannot at present inform you what action the North-West Provinces Government or the Government of India have taken on my proposals.

It appears from your communication that Captain Chapman is very anxious that, if the machine is to go to him, it should arrive in time for the autumn crop (rice), *i.e.*, be delivered before October.

I am unable of course to give you any authority on behalf of my Government to send the machine; but under the circumstances advise you (if you are able to do so) to obtain the assistance of the India Office

in telegraphing to the Government of India to know if sanction can be given to the despatch of the machine.

No. 211, dated Simla, the 31st July 1878.

From—C. J. LYALL, Esq., Under-Secy. to the Govt. of India, Dept. of Revenue, Agriculture and Commerce,

To—The Secretary to the Government of the North-Western Provinces and Oudh.

With reference to your letter No. 841A., dated the 3rd April last, I am directed to request that, with the permission of His Honour the Lieutenant-Governor, you will be good enough to forward at an early date the report by Mr. E. C. Buck, promised therein, on the advisability of importing steam-threshing machines for use in this country.

No. 2590A., dated Naini Tal, the 29th August 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

With reference to your letter No. 211, dated the 31st July 1878, I am directed to submit, for the information of His Excellency the Governor General in Council, copy of a letter* from the Director of Agriculture and Commerce, North-Western Provinces and Oudh, with its enclosures in original (to be returned), together with copy of the orders† passed thereon, on the subject of the introduction of steam-threshing machines into India.

* No. $\frac{553T.}{CLXIA}$, dated the 17th of August 1878.

† No. 2588A.

2. His Honour would draw especial attention to the letters of Major Orr and Mr. Michel as representing the arguments for and against the proposal.

No. 2588A., dated Naini Tal, the 29th August 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

In acknowledging the receipt of your letter No. $\frac{553T}{CLXIA}$, dated the 17th August 1878, with which you submitted a report on the introduction of steam-threshing machines into India, I am directed to observe that the correspondence, and especially Major Orr's letter, conclusively shows that the Government should not be instrumental in introducing steam-threshing machines into the country.

2. His Honour, however, sanctions the proposal made in your letter No. $\frac{554T}{CLXIA}$, dated the 17th instant, to purchase a small winnowing machine from Messrs. Ransomes & Sims, to be worked under Mr. Spedding's supervision at Barhaj in the Gorakhpur District, the cost being defrayed from one of the farm grants at your disposal.

No. $\frac{553T}{CLXIA}$, dated Naini Tal, the 17th August 1878.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government of the North-Western Provinces and Oudh.

I have the honour to submit a report on the proposal to procure for these Provinces steam-threshing machines recommended by Messrs. Ransomes & Sims in a letter forwarded under cover of Government of India letter No. 63, dated 21st February 1878.

2. The correspondence was forwarded to Commissioners of Divisions for an expression of their opinion, and that of the officers of the districts under them, as well as of practical agriculturists, in a circular dated 22nd April last, of which a copy is enclosed; and I promised a report in the present month on my return from leave. Meanwhile, in my letter to Government No. 551A., dated 22nd April last, I suggested procuring a machine for Captain Chapman, planter of Allahabad, who, for reasons stated in that letter, was likely to be able to give it a full trial; but Government in their G. O. No. 1163A., dated 4th May last, decided that no action should be taken until the submission of my report.

3. I have now received replies from the Divisions (noted in the margin),* and do not consider it desirable to postpone my report for the communications still due from the remaining Divisions (also noted in the margin),† since, if any machine or machines are to be procured in the present year, it will be necessary to send early orders to Messrs. Ransomes & Sims.

* Meerut.
Rohilkhand.
Benares.
Jhansi.
Kumaun.
Lucknow.
Fyzabad.
Rai Bareli.

† Agra.
Allahabad.
Sitapur.

4. It is very noteworthy that while all district officers (except those named in the margin) deprecate any trial of the machines as useless and unsuited to the agricultural conditions of this country, some of the leading planters of the province (Captain Chapman, Mr. Michel, Mr. Herbert Smith and Colonel Ouseley) advocate an experiment. I have only a short letter from Captain Chapman, in which he expresses readiness to try the machine; but I obtained his opinion in greater detail at a personal visit to his estate in April last, to which I have made reference in my letter No. 351A., dated 22nd April. Letters from Mr. Michel and the others named I append to this report.

Mr. Colvin of Bijnor.
Mr. Wyer of Budaun.

5. It is, I consider, right to give a preference to the opinion of practical men on any question which directly affects agricultural operations. The gentlemen whose names I have given are all strongly impressed with the difficulty which now exists of getting in the harvest quickly. Mr. Colvin, Collector of Bijnour, also dwells on this point, noticing the severe loss which in the last season zamindars suffered from peculation. Another risk which undoubtedly exists is that incurred from the stormy weather which frequently prevails in March and April when grain is on the threshing-floor.

6. I questioned in my first communication to Government (No. 375A., dated 24th March last) whether any project would succeed

which involved the enforced idleness of cattle during the threshing season; on which objection Mr. Colvin makes the pertinent criticism that cattle labour can at that time be most usefully diverted to the carriage of grain. This is very true. Moreover, the conversations I have held with Captain Chapman and others convince me that to subsidise the labour of village-cattle, of which the working power is at the time of harvest unequal to the demand, will be of real benefit to the agricultural population.

7. There is therefore a strong *primâ facie* reason in favour of the use of the machine of the character suggested. But the difficulties suggested by one or other of the officers consulted on the subject are not few. In the first place, there are very few landlords with large estates, of which the land and the produce which it bears are solely under their own control, since most of the cultivated land of these Provinces is sub-divided into small 5 or 6 acre holdings, within which each tenant, being the jealous owner of his own grain, would resent any interference with his harvest operations.

8. In the second place, hardly any landlords have yet been found who are willing to advance any capital for any undertaking which is in the least doubtful or hazardous, however strongly recommended by official advice, or even by the practical example of European planters. I am aware of indigo estates where English ploughs have long been used, in the neighbourhood of which not a native has asked for the new implement, or showed any desire to try it. See the remarks under this head in Mr. A. Stumer's letter forwarded under cover of Collector of Azamgarh's letter No. $\frac{78}{VII}$, dated 8th July.

9. In the third place, it is doubtful whether fuel is available at a sufficiently cheap rate. It seems doubtful how far it is right to advocate a system which contains within itself the destruction of much of that vegetable matter which is required both by cattle and by land. It is true that ashes will remain as manure; but some of the fertilising matter is destroyed by combustion.

10. A further objection has been raised by some officers that the roads in agricultural tracts are not good enough to admit of the transport of an engine and machine from one place to another.

11. In my opinion a machine of the kind proposed is proved to be a desideratum if it can be economically worked. The section of the agricultural community to whom it will be at present most useful are undoubtedly the European planters, who have large estates, of which a considerable area is under their own control. They find it difficult to procure labour at a time when there is an extreme pressure of agricultural work. They have the energy to introduce, the ability to manage, and the education to appreciate agricultural machinery; and by their assistance only can a thorough experiment be tried.. Had they been opposed to the trial of it, I should have had great diffidence in proposing any experiment; but with their advocacy and offer of assistance I have no hesitation in recommending that Government should support the proposal made by Messrs. Ransomes & Sims.

12. I am quite convinced that the issues raised by the different officers and gentlemen who have written on the subject can only be set finally at rest by a genuine trial of the machine. I have, as Government is aware, always advocated the principle that agricultural experiments can be much more efficiently carried out, and with much greater chance of attracting the attention of other agriculturists, if entrusted to the hands of practical planters, instead of being tried in a Government farm, where we have less practical knowledge, and less chance of proving the commercial results of any new agricultural method which may come under trial. In planters, who are, as in this case, willing to come forward, we have in effect unpaid farm superintendents of the highest practical ability.

13. I have alluded to the suitability of Captain Chapman's estate for one trial. I advocate Mr. Michel's estate for a second. Mr. Michel is a well-known planter of great intelligence, and possessed of the strongest desire to improve the agriculture of the country, as exhibited in the time, trouble and expense which he has devoted already to the trial of various kinds of machinery, and also in the valuable information and advice with which he has from time to time supplied Government officials. His present letter bears within itself internal evidence of the genuineness of his wish to give every assistance to Government in the matter under report, and of the great practical knowledge which he possesses of the circumstances connected with the subject.

14. I advocate, therefore, the purchase of two machines for trial on Messrs. Chapman and Michel's estates for a term of three years, at the end of which, if found unsuitable, they may be returned by them, or, if successful, retained at such price as may be arranged. I would, however, stipulate that in the former case Messrs. Ransomes & Sims should be asked to accept a cost price for the machines (no more being paid pending the trial).

15. It is not my duty perhaps to suggest whether the cost of the machine should be charged to the Imperial or Provincial Government. If, however, this is the only Province in which the experiment is made, should not the charge be imperial, since the trial will be made for the benefit also of other provinces?

16. I have not alluded to the advantage of cleaning wheat. This may be an advantage to large exporters like Captain Chapman, whose interest it may be to acquire a name for his wheat. But it is a fact that, as a rule, wheat, however clean, is dirtied after it leaves the producer's hands; and it is doubtful whether the agricultural body really benefit by any wheat-cleaning process.

17. The attention of Messrs. Ransomes & Sims may be called to the suggestions of introducing machines to be worked by bullock labour. I should, however, prefer to be allowed to place Messrs. Chapman and Michel in direct communication with Messrs. Ransomes & Sims, and to permit them to arrange for the construction and trial of any bullock-labour machines which after correspondence on the subject they might recommend. I have asked in my No. $\frac{554T}{CLXIA}$, dated 17th August 1878, that I may be permitted to supply one to Mr. Spedding, Collector of Gorakhpur.

18. Should my proposals be accepted, I urge that no time shall be lost in pressing upon the Government of India the desirability of the immediate despatch of machines; and suggest the advisiability of a communication by telegraph to Messrs. Ransomes & Sims, who, with Captain Chapman, are very anxious that next season shall not be lost. Captain Chapman is now in England, and prepared to assist Messrs. Ransomes & Sims with his advice.

19. I have noted in an appendix those letters or extracts which seem specially worthy of being brought under the notice of Government.

Dated Allahabad, the 9th May 1878.

From—CAPTAIN F. C. CHAPMAN,

To—The Director of Agriculture and Commerce, N. W. P. & Oudh.

I beg to acknowledge copy of your No. 551A., dated 22nd April 1878, to the Secretary to Government, North-Western Provinces and Oudh.

As you know, the time for threshing out the crop in India is April and May; and to make a machine of use, it should to it have attached fittings for husking rice. In all this part of India each assami, well-to-do, has 20 to 25 per cent. of his land in rice. In fact, rice pays the kharif rent. I do not see why one machine should not be so adapted as to thresh wheat and barley, and husk rice.

Of course, it is a *sine quâ non* that the straw should be delivered as bhusa.

I am going to England for the hot season, and could, if desired by Government, see Messrs. Ransomes, Sims & Head, and describe the requirements of Indian agriculture.

Dated Rai Bareli, the 6th June 1878.

From—MAJOR A. P. ORR, Talukdar of Ludwari, Zilla Rai Bareli,

To—The Deputy Commissioner, Rai Bareli.

I have been favoured with copies of correspondence accompanying your docket dated 17th May, on the subject of a threshing machine—whether it is desirable to obtain any such machine with a view to the development of the Indian wheat trade. And you have asked me for my opinion on the matter in question.

It seems to me that, so far from its being desirable to obtain any such machinery simply with a view to exhibit its performance to native agriculturists, and thus induce them to introduce its employment in this Province (for I only write in reference to Oudh), the experiment would end in total failure, because—

Firstly.—The people, whether talukdars, zamindars, or kashtkars, would soon perceive that the machine would not answer their purpose—first, because it would not compete with the cheapness of manual labour and cheapness of grain, and secondly, because its employment would not be compatible with the present system of cultivation in Oudh.

Let us consider the objections abovementioned, and see if they are well founded.

In the concluding portion of his letter to Mr. Crawford, Mr. Head writes:—

"When one looks around at the increasing demand for steam-power for irrigation, for working tea and indigo factories, and also for many other purposes throughout India, I cannot see why it cannot be introduced for agricultural purposes, and why eventually the same system of preparing the crop for the market could not be adopted in India as in the east of Europe and in America."

It seems to me that it is not difficult to give a reply to the above. And, first, the tea or indigo planter is master of the whole concern under his management. He works it according to his own ideas; and he is naturally anxious, *and has it in his power,* to save expenditure, if possible so to do, by employing steam or other machinery in lieu of manual labour.

If the talukdar or large landholder in Oudh (I repeat that in this paper I speak only with reference to Oudh) *himself* cultivated the whole, or nearly the whole of his taluka or estate, he might perhaps, with advantage to himself, employ steam-threshing machinery, although by so doing he would deprive hundreds of labourers of bread. But in point of fact he himself cultivates but an extremely small portion of his estate, the remaining, and infinitely larger, portion being parcelled out and partly leased to petty farmers, but in far larger proportion cultivated in smaller or larger patches by tenants under, generally speaking, an annual lease. Under such a system, is not a great difficulty in the way of introducing agricultural machinery, such as is contemplated, at once perceived?

Secondly.—In so far as Oudh is concerned, it is not possible to compare such a densely-populated country (as the greater portion of it is) in which manual labour is extremely cheap with the east of Europe, where the same conditions do not exist either in regard to density of population, to system of agriculture, and *probably* price of grain. I have said that the talukdar himself cultivates but a very small portion of his estate compared with the whole of its area; and to thresh and winnow the wheat grown by him (required monthly for the use of his own household, including retainers, &c.), it would hardly be worth his while to employ such expensive machinery. The talukdar and the petty zamindar follow precisely the same system of cultivation. It is entrusted to labourers usually residing in the villages of the estate. These labourers carry on all the agricultural processes during the whole year; and their principal remuneration for this annual labour is what they receive at the completion of the kharif and rabi harvests. Since the subject of the correspondence in which I have ventured to make a few remarks is solely concerned with suggestions relative to a better, and it is thought by Mr. Head a *cheaper,* mode of threshing and winnowing wheat, let us glance at the work the labourers perform at the wheat harvest. They cut the standing corn, they thresh out the grain, they winnow it, and at *this* time (but *not* for this labour *only*) they receive usually $\frac{1}{16}$th, or say 6¼ per cent. of the grain produced. After the

threshing there generally remains some grain in the ear; and this grain is recovered during the process of converting the straw into bhusa or fodder, and for the portion of his work the labourer receives one-third of the grain thus recovered. He then without further remuneration carries the grain and the fodder or bhusa to the talukdar or zamindar's house.

The machine recommended by Mr. Head simply threshes and winnows the grain, and converts the straw into fodder, but of course with infinitely greater rapidity than could be done by manual labour. But the standing corn must still be cut by the labourer; *he* will have to convey the sheaves to the machine, and the resulting grain and bhusa must still be carried by *him* to the proprietor's house. Thus the machine does but a small portion of the labourer's work, although much more expeditiously—*but at what cost?*

I cannot discover from Mr. Head's papers what would be the exact or even approximate working cost of his threshing machine; but that gentleman makes mention of three items:—

1*st*.—Wages of a European engineer at £20 per mensem, with board and lodging at Government expense, or of course compensation for the same. I suppose that in lieu of the European engineer a native machine-driver might be substituted at a less cost.

2*nd*.—Wages of probably more than eleven men to attend to the requirements of the machine.

3*rd*.—Cost of fuel.

But evidently to the above must be added—

4*th*.—Expense of oiling the machinery whilst in work.

5*th*.—Expenses of wear and tear.

6*th*.—Transit charges from village to village.

7*th*.—Item of profit to owners of machine.

To the above must be added, I suppose, the expenses of the machine whilst lying unoccupied.

All these expenses must form in the aggregate a considerable sum, which, after all, will cover the charges for only threshing the corn, winnowing it, and converting the wheaten straw into fodder; the advantage on the other hand being rapidity of work. Now, let us remember that the abovementioned operations do not by any means exhaust the list of agricultural processes carried on throughout the whole year by the village labourers. They it is that till the soil; they sow the seed; they weed and water the fields; they reap the kharif and rabi harvests; they cultivate the rice crop, and tend to the cattle, &c. And for all this great amount of labour they receive a very modest wage at, as I have already said, the completion of the kharif and rabi harvests, with a slight remuneration over and above. Altogether their wages will hardly ever exceed Rs. 3 per month, or Rs. 36 per annum. And at *such* a rate per annum, even if many men are employed, we see at once at what an extensively small cost the grain is threshed and winnowed, the straw converted into bhusa, and both bhusa and grain conveyed to the proprietor's house. Can machinery compete with manual labour at such low rates of remuneration?

Again, supposing for a moment that the steam-threshing machine were introduced into the villages, the services of the labourers could thereby by no means be dispensed with; but the talukdar or zamindar, to retain them in their employ, would still have to give them their usual wages (for on less they could not live), and thus entail on himself, not only the enhanced cost of having his corn threshed by machinery, but also the payment of full wages to his servants. In other words, he would have to pay twice for the work done, *i.e.*, for the threshing and winnowing of his grain.

If we suppose that the landlord should insist in making a deduction in his labourers' wages in consideration of the costs incurred through the use of the threshing machine, they would undoubtedly desert the place and endeavour to seek employment elsewhere, and thus expose themselves to much misery and distress, perhaps to starvation and death.

Having shown the very serious difficulties that would attend the introduction of the machinery under consideration into this province in so far as talukdars and zamindars are concerned, it seems almost useless to say that the kashtkars, or actual cultivators, would not for a moment think of employing machinery, even were it in their power to do so, as long as they can with unpaid labour do their work with their own hands. In their present impoverished state the saving of time and labour effected for them by machinery would indeed be dearly and ruinously bought—first, by the *costs*, including loss of the fodder consumed by the machine; secondly, by the enforced idleness of the members of the family and of the cattle, the charges of food, &c., remaining the same whether the said members and cattle remain idle or are at work. Another point which seems to me of great importance in connection with the present subject is the *cheapness* of grain in this country—cheapness which will be another obstacle in the way of employment of agricultural steam machinery.

I have just now no means of ascertaining the value of wheat in Spain and Russia (countries mentioned by Mr. Head), but probably in those countries it is much dearer than in Oudh. At all events, on looking over the columns of an American paper dated 4th April 1878, the shipping prices of wheat ranged from 1·47 dollars to 1·29 dollars per bushel. This is evidently much dearer than the cost of wheat now even in times of unusual scarcity such as we are experiencing at the present moment.

Enough, I think, has now been said to show that the objections that the people would raise against the employment of the steam-threshing engine on their lands are well founded; and such being the case, I would strongly advise that no such expensive machinery be purchased and imported into this country at the cost of Government for the sake of an experiment; which, I venture to say, far from conducing to the results hoped for, would end in great disappointment, and in heavy and useless expenditure, and if any further argument be wanting in support of what I have just advanced, I think it is furnished by Mr. Head himself. In his letter to Mr. Crawford that gentleman writes: "From information I have received I gather that it would be almost impossible to form an

association or company of small farmers in India to purchase a steam-threshing machine which would be let out for hire at a fixed rate," &c.

All that I have written corroborates very strongly, it seems to me, the information above referred to received by Mr. Head. Who, then, is to purchase the machine; and how is it to be introduced into this country?

In conclusion, I would not, especially at the present time, recommend the introduction into this country of any agricultural or other machinery the use of which would tend to deprive vast numbers of the poor of their bread. We want in this over-populated Province most certainly not a diminution of actually existing sources of labour, but on the very contrary as great an increase of such as possible. By and bye, when the advantages of emigration are better understood by the people, and they have greater facilities of seeking abroad the means of livelihood so meagrely afforded to them in their own country; when thousands on thousands are tempted to seek their fortune in other lands; and when, through their absence, labour becomes in the country they have left more expensive, and grain consequently rises in value—then, and only then, may we hope to see steam agricultural machinery appreciated. In the meanwhile, owing to the marvellously cheap nature of manual labour, and to the cheapness of grain in this country, Oudh can, even without the aid of the steam-threshing machine, compete, I think, with other countries in the sale of wheat in the English market.

Dated Kharauli, the 6th June 1878.

From—G. GARTLAN, Esq., Manager, Palmerland Estate,
To—The Deputy Commissioner, Rai Bareli.

With reference to steam-threshing machines, and the advisability of their being imported for employment in India, I have the honour to express my humble opinion that the introduction of those machines into this part of the country would at present be both undesirable and unremunerative. In this part of India the country is densely populated; the cultivators' holdings are generally small and situated close to the homestead; labour, which is abundant, is also cheap; and the operation of threshing is so intimately connected with the other operations of the cultivation of the soil and of the harvesting of the crop, that any interference with the present custom is to be deprecated, unless the advantages from such an innovation can be shown to be undesirable, and the willingness of the people to use the machine be clearly proved.

The substitution of machinery for the ordinary labour prevailing in these districts would necessitate the idleness of cattle and of daily labourers; and any measure leading to such a result appears most undesirable. The fact of the produce being ready sooner for export by employment of machinery does not strike me as an advantage for the Oudh cultivator; whilst the fact of the demand for labour being diminished by the introduction of machinery seems to me a decided disadvantage. The employment of machinery for threshing would not enable the cultivator to dispense with his bullocks; and the inferior fodder produced by machinery would also be an evil to be avoided.

In conclusion, I would mention that the machines, if introduced, would have to be transported to the spots convenient to the cultivator; for the latter would not disturb his own harvesting operations for the convenience of the machine people.

No. $\frac{508}{VII}$, dated Gorakhpur, the 7th June 1878.

From—R. D. SPEDDING, Esq., Offg. Collector of Gorakhpur,
To—The Commissioner, 5th Division, Benares.

In reply to your docket No. $\frac{22}{VII}$ of 14th ultimo, I have the honour to report that I have taken the opinion of some officials and planters in the district who are able to judge of the possible success of steam-threshing machines in Gorakhpur.

2. Their opinion coincides with my own, that native agriculturists would prefer not to use machines.

3. One planter (Mr. McKae of Babhnauli) has, in fact, a steam-threshing machine at work; and he writes: "The natives came in crowds to see it working, but expressed no wish to have their corn threshed by it. They prefer using their bullocks for that purpose, partly because they have no other work for their cattle during harvest, and partly because the treading-out keeps the cattle in good condition at a season when grazing is scanty."

4. The native farmers have to keep up a certain number of bullocks for ploughing; and they would be without employment and on less food if their "treading-out" work was done by machinery. They never grudge their cattle what the latter eat when treading out the corn.

5. The roads in the district are so heavy and cut up, that it would be very difficult to get a weighty machine about. Again the means of carriage of grain (mainly by water) from this district to the down-country marts are so tedious, that the grain in time, owing to steam-threshing, would be of little value here.

6. A machine much more likely to be a success in this district would be the ordinary "winnowing machine," worked by hand, or a simple cleaning fan, which might be worked by cattle. If light and not expensive, these machines would probably be a real benefit in the neighbourhood of the large grain marts.

7. In the eastern districts the strong winds, which enable the farmers to winnow their grain up-country, frequently fail; and the chief complaint against Indian wheat is the dirty condition in which it is sent to market.

If the grain-dealers come to know of the rapidity and completeness with which grain can be cleaned by a good winnowing machine, they would probably encourage its introduction.

8. If the Director of Agriculture and Commerce would recommend me a cheap and effective winnowing machine for cleaning corn, I believe it would be a financial success if I sent it to the large grain mart at Barbaj. This mart belonging to the Majhauli estate, I could provide funds for the experiment in next year's budget.

Dated Sultanpur, the 14th June 1878.

From—C. CHAPMAN, Esq., Assistant Commissioner, Sultanpur,

To—The Deputy Commissioner, Sultanpur.

I would not recommend the purchase of one of these machines. The difficulties attendant on the possession of such a white elephant would be endless, and the advantages almost *nil*.

Without going into the broad question as to whether any part of India is sufficiently advanced, from an agricultural point of view, to thoroughly and lucratively reap the benefits of steam machinery, It hink we, in Sultanpur, for the following reasons had better remain satisfied with the time-honoured, though somewhat slow and may be wasteful, practice in vogue amongst the people of threshing and winnowing.

1. The cost of the machinery is great; and there is no landowner who could afford the luxury, with the exception of the Raja of Amethie. And he, I am sure, would not expend a pice for the good of his tenantry.

2. The skilled mechanic, with expenses of his board, lodging, wages, passage out and home, and an agreement binding his employer to engage his services for a term of years, would scare any native landlord.

3. Individual holdings are small; and the village Kharehema represents at least a dozen different interests, if not more. Considerable time would be wasted in sweeping away one man's grain, straw, &c., before the next-comer could have the use of the machine. There would be considerable difficulty about the supply of fuel too. The man who had only a few sheaves to be threshed would not see the justice of supplying fuel to bring the machine up to working-power.

4. To be of any practical use, the machine would be required to be constantly on the move from one village to another. In this district, where roads are few and far apart, and there are innumerable ravines and nalas, the area over which the machine could travel would be very limited. Further, wheat is cut in the hot season; and the mechanic, if he is to be always present with the machine, would have to be supplied with camp equipage.

5. Very few natives understand that time is money, even if it were demonstrated to them that by use of steam machinery they could bring their produce earlier into the market, and thereby obtain a quicker return on their capital. I doubt if they would deem themselves compensated for the enforced idleness of cattle which they have by them, and without which they cannot live. Further, the use of machinery would throw out of employment numbers of hands who during the harvesting operations of the rabi obtain food enough to keep themselves going until the autumn crops ripen. In a country like this, where, with the exception of large towns, the field for labour, skilled or unskilled, is very restricted, to rob the lower labouring classes of such employment as they now obtain would lead to endless trouble.

6. I very much doubt, considering the peculiar condition of the agricultural community, whether threshing and winnowing could be done cheaper than by the present homely system.

7. If it be intended that Government should import some of these machines as a speculation, in the hope that they may at some future period take the people's fancy, they should be located in the centre of some large tract of wheat-producing country; but even then I doubt if the producer will take the trouble to bring his sheaves any distance to be threshed. An itinerant machine, I do not think, would pay its expenses.

No. 317, dated Bijnor, the 31st May 1878.

From—A. COLVIN, Esq., Collector of Bijnor,

To—The Commissioner, Rohilkhand Division.

In reply to your circular No. 54, dated 18th instant, I have the honour to state that I think the experiment well worth trying, though it will be a long time before the innovation finds favour.

2. The evil of delay in threshing grain caused by the present slow system of working has been brought strikingly home this wet season to the landlords, who have suffered severely from peculations on the threshing-floor consequent on that delay.

3. The machine would have to be worked at first by Government, and all profit and loss would be a Government affair. The large landlords in this district, and in many others, would certainly give it a trial; and quick returns of rent being so dependent on a quick getting-in of the harvest, I think that among landlords at least the project would gradually find favour. Their influence is of course great with the cultivators.

4. With regard to the first of Mr. Buck's objections, I do not see why there should be any idleness of cattle owing to the introduction of a threshing machine. So far as this district is concerned, cattle when not wanted for field purposes are largely used for grain traffic. Anyhow, the objection is very far fetched; for the machines are not likely during this century to be employed on a scale so large as to dispossess cattle.

5. As to Mr. Buck's second objection, I do not think the fodder supply would be seriously lessened by the machine.

Opinion by LUCHME NARAIN *on the threshing machine.*

No doubt a threshing machine has hitherto been a desideratum in India, which stands far behind in the development of its corn trade to its sister countries of the Western Continent; but the one recommended by Mr. J. Head does not seem to answer the wants, for reasons noted below:—

1*st*.—The roads for carrying a steam machinery from village to village are too bad in India.

2*nd*.—The machine seems to fail in its main object (immediate exportation), as it can only deliver on an average about 12,000 bushels (about 10,000 maunds) in a month at a cost of Rs. 769, or 12¾ annas per maund (as per detail at foot), to the proprietor. This quantity is no more than the produce of about 700 acres, or about 5,000 kutcha bighas; which, without costing anything to the cultivators,

is easily prepared within the same period, as the cultivators do not calculate their own and their cattle's labour in threshing.

3*rd*.—No loss under the current system of threshing the crops is sustained by the cultivators, except in an unusual season like this, in which scarcely a day passes when it does not drop in some part of the country; nor is any part of the straw left out as refuse, as remarked by Mr. J. Head in his letter.

4*th*.—In the memorandum of Mr. J. Head no mention whatsoever is made of the following ideas:—

(*a*) Can the machine work in cloudy and rainy season when the straw is wet?

(*b*) Can the machine thresh also other corns than wheat?

(*c*) How much straw would it require for threshing each time; and what arrangements would be made for threshing the crops of petty cultivators whose net outturns of wheat alone are, as a rule, generally less than even 10 or 12 maunds. (The produce of all the cultivators of a village cannot be threshed together.)

5*th*.—Almost all the zamindars cannot speculate their money in introducing the threshing machine experimentally.

Under these circumstances it appears to me that if the above-mentioned obstacles be removed, the only plan for introducing steam-threshing machines into this part of the country would be for Government to purchase a few machines and work them in localities where they might be exhibited to as large a number of agriculturists as possible. When their advantages would be known, the big zamindars will probably purchase such machines.

Detail of costs.—Mr. J. Head has not fully detailed the monthly charges of the machine. I have made them out after making enquiries from the Commissariat Office here, where a steam engine is used for grinding flour.

	Rs.
A European supervisor, as per Mr. Head's letter ...	200
1 Ironsmith	14
1 Carpenter	12
10 Coolies and bhisties, per cooly Rs. 5 a month ...	50
3 Seers castor oil per diem	30
1 Seer of sopada and 2 seers of linseed oil for cleaning the machine	13
Wages of bullocks for carrying the machine from one village to another	30
Fuel (there being no refuse straw)	360
Interest on Rs. 7,000 at 5 per cent.	30
Damage	30
	769

Average of expense of threshing as per maund, Re 0-12-4.

If the engine used in threshing machine is lighter than the one on which I have made the calculation, the cost of fuel, &c., will be less proportionally.

In conclusion, I beg to say that, as the labour is cheap in this country, the steam machines cannot work here so profitably as in Europe.

In this country light and cheap threshing machines, worked by hand, if invented, will do much good.

Employment of steam-threshing machines for development of the Indian wheat trade.

There can be no doubt of the many advantages which might result from the introduction of threshing machines such as are described in the letter of Mr. Head.

I am of opinion that the Government would do well to import one or two such machines by way of experiment.

At the same time I am certain that such a machine would not pay its working expenses.

From what I can hear from friends engaged in the wheat trade in Bombay, the Indian wheat is called dirty rather from its being mixed with other grains than from it being "dirty" in the ordinary acceptance of the word.

In this part of India, owing to the prevalence of dry hot west winds during April and May, immediately after the crop is cut, the wheat is very rapidly prepared for the market by the ordinary native methods; and as a rule is particularly dry and well coloured. I do not think that employment of steam-threshing and winnowing machines would enable the grain to be brought to market very much more quickly than at present. Further, as Mr. Buck remarks, any saving in the matter of bullock labour is unimportant, as the bullocks must be kept by the cultivators for ploughing and other purposes in any case.

In my opinion the introduction of some simple threshing and winnowing machines, to be worked by bullock-power, would be found a more practical means of improvement.

I applied to Mr. Buck this season for some such machines; and through him an offer was made to me by Mr. Michel of Daona in the Meerut district.

I enclose a letter from him, which was received through Mr. Buck, from which it will be seen that Mr. Michel has not a very high opinion of the usefulness of such machines. I think there was another letter from Mr. Michel, forwarded by Mr. Buck, in which he stated that the threshing machine did not succeed with the Indian wheat owing to the brittleness or toughness of the straw. This failing would however, I have no doubt, be easily corrected by some alteration of the machinery. After all, the only question is one of finance; and I very much doubt whether threshing machinery driven by steam-power will pay.

At the same time there is no better way of finding this out certainly than by actual experiment; and in my opinion the purchase of a few sets of machinery by Government, and their careful and systematic trial under skilled supervision in some such way as suggested in the

letter of Mr. Head, might be undertaken with great advantage; and I sincerely hope that the Government of India will decide on making the experiment.

BUDAUN; *The 1st June* 1878. } T. R. WYER, *Assistant Collector.*

No. $\frac{78}{VII}$, dated Azamgarh, the 8th July 1878.

From—A. C. TUPP, Esq., Officiating Collector of Azamgarh,
To—The Officiating Commissioner, 5th Division, Benares.

In reply to your docket No. $\frac{22}{VII}$, dated 11th May 1878, I have the honour to inform you that I have circulated the papers on the subject of steam-threshing machines to all the European planters of this district, and to enclose copy of a letter on the subject from one of them, Mr. A. J. Sturmer.

I quite agree in the view he has taken; and my experience with the sugar mill at Dubari has been just the same as his with the winnowing machine. None of the other planters have expressed any opinion.

I do not think that a steam-threshing machine could be profitably used in this part of India; and I am sure that no native proprietor will willingly buy one.

Dated Taluka Kajha, P. O. Chariakot, the 30th May 1878.

From—A. J. STURMER, Esq.,
To—The Collector of Azamgarh.

In returning the circular received with your memorandum of the 23rd May, I have the honour to state that, though the introduction of machinery for threshing and winnowing grain would be very useful, the circumstance of the generality of cultivators being holders of small plots of land would make it impossible for the grain to be collected in bulk. I brought up a winnowing machine from Calcutta at a cost of Rs. 200; but I find the utmost difficulty in getting my servants to make use of it. Their prejudice is so strong, that at the slightest opportunity they revert to their old plan. I have found the machine very useful, and my tenants have seen how speedily and well it winnows the grain; yet they will not avail themselves of my offer to use it.

No. 210, dated Benares, the 11th July 1878.

Endorsed by Officiating Commissioner, Benares.

Copy of the foregoing forwarded to the Director, Agriculture and Commerce, North-Western Provinces, in continuation of No. 202, dated 5th instant.

No. 335, dated Dehra Dun, the 11th July 1878.

From—H. G. Ross, Esq., Superintendent of Dehra Dun,
To—The Officiating Commissioner, 1st Division, Meerut.

In reply to your circular No. 32, dated the 13th May, and enclosure, I beg to enclose copies of letters from Colonel Ouseley and Mr. Bell on the subject.

2. I have consulted other planters in this district. As a rule, they doubt whether a threshing machine would pay; and they all agree that a winnowing machine is more urgently required than a threshing machine. A threshing would of course have a winnowing machine attached.

3. There would be no object in having a straw-burning machine, because any decrease of fodder in way of burning straw, &c., is most strongly to be deprecated.

4. I do not think, even supposing the threshing machine were used, that cattle would necessarily stand idle—certainly not in this district. The cattle and men would always be employed, either ploughing their own lands or carting manure for tea-planters.

5. The machine would in the first instance have to be imported by Government, and worked by Government on payment per maund of wheat turned out. I feel pretty sure that no zamindar or combination of zamindars would start off a machine on their own account without having first seen how it worked.

6. The advantages of a steam-threshing machine are undeniable—saving of time, clean wheat, and saving of expense. But I doubt much if it would ever pay.

Dated Dhaikrani, the 4th July 1878.

From—Colonel R. Ouseley, Zamindar of Dhaikrani, Dehra Dun,
To—The Superintendent, Dehra Dun.

In reply to your office No. 390, dated 18th May 1878, received on the 3rd July 1878, I have the honour to state that I am in favour of the employment of steam-threshing and winnowing machines in India, not only for the actual saving likely to result, but also on account of the indirect profits certain to accrue to the people from the employment of such machinery.

2. Say that ten maunds or twelve and a half bushels of wheat can, under the most favourable circumstances, be threshed and winnowed by six bullocks and two men in two days, and reckon the cost at one rupee per diem or two rupees. Four hundred bushels or three hundred and twenty maunds, the minimum outturn of one machine per diem, would cost sixty-four rupees. Thirty days at say sixty rupees per diem give eighteen hundred rupees. I see by the correspondence which accompanies your letter under reply that a machine complete could be landed in India for about seven hundred pounds, and that a skilled mechanic, including passages to and fro, would cost in one year about four hundred pounds. Calculate the cost to cover expense of buildings, &c., at £1,500; and still one month's working would give good interest on that sum.

3. But indirectly the profits to the people would be far greater than those caused by the actual saving above mentioned, because of course the machinery would be worked at lower rates than two rupees for ten maunds. Once the process of threshing is commenced, unbroken sunshine and dry weather is required to the end of it. If even a little rain falls, days must elapse before the interrupted process can be recommenced. But a tenant watches the produce of his own holding even

though several bring their grain to one floor, and still much thieving goes on. If the weather is unfavourable, the grain is damaged; and men and cattle, who might be preparing land for other crops, fencing their holdings, repairing their watercourses, or working for hire, are kept idling about the threshing-floor. I have never calculated what the percentage of loss by the local process may be; but I know that the straw is often mixed with cowdung, and that much waste occurs both in threshing and winnowing.

4. I cannot afford it, or I should send for a machine and a skilled mechanic at once.

Dated Harbunswalla, the 22nd May 1878.

From—W. Bell, Esq.,
To—The Superintendent of Dehra Dun.

In reply to your memorandum No. 390, dated 18th May, regarding the advisability or otherwise of threshing machinery for Dehra Dun, I think such machinery might be of great advantage in precarious seasons, such as the past and present, in allowing the cultivators to get their grain under cover, and so escape damage by exposure to the weather. However the "straw-burning" arrangement is in every respect objectionable, as such machinery would in no way lessen the necessity for keeping cattle, which, while kept, must still be fed. Hence Mr. Head's argument, that "the cost of threshing by steam would be actually much less than when oxen are used for the same purpose," is nothing whatever to the point as in districts where the cattle constantly live on the verge of starvation. Any arrangement that would destroy "fodder" is objectionable; and the arrangement proposed by Mr. Head would destroy about $1\frac{1}{2}$th of the whole. So if that difficulty could be got over, "threshing" by machinery would no doubt soon become "popular"; but whether or not "remunerative" in such a district as the Dehra Dun is a matter on which I can offer no opinion.

Dated the 16th July 1878.

From—J. Michel, Esq., Mussoorie,
To—The Offg. Collector and Magistrate, Meerut.

I have the honour to submit, in reply to your invitation, a few remarks on the proposed introduction of threshing machines into India.

2. Having carefully read the arguments and suggestions of the manufacturers, and set before me the conditions of agriculture in these Provinces, especially with their relations to foreign and particularly the English market, I am of opinion that a great stimulus may be given to the exportation of wheat as a speciality by the introduction of proper and efficient machinery for its rapid and thorough preparation, which, with the facilities we now enjoy of quick transport by rail, ought to forestall the home harvest and win a good place in competition by so doing; and under any circumstances, short of actual dearth in this country, it must always realise a higher price than the local consumer can afford to pay for it, freight and all such charges added.

But the question of economical application must first be established, premising, as a matter of course, that the machinery is thoroughly effective and automatic, capable of not only separating seed from the ear, but also properly crushing and preparing the straw for consumption as fodder, which is generally equivalent to one-fifth the value of the crop.

And, while on this point, I may warn the Government against the purchase of any machine that is declared to deliver the straw in its full length intact, as in my experience with one of the best drum machines made by this firm now under treaty it is quite impossible to do so; and though the firm have not yet (seemingly) quite found out the reason, they are (I think) conscious of their failure.

As a matter of fact, I believe that Indian wheat and barley straw has much less silica in its composition, and is thereby fitted for animal consumption; but it is so devoid of tensile strength, silex being the particular element which imparts strength to all fibres, that it cannot be drawn by the draw of a machine without breaking into short lengths, the ears being also prematurely broken off; and no manipulation by any winnowing machine or other known process can effectually separate the seed from those ears, nor can the resulting material be afterwards dealt with for preparation into fodder, as merely passing it through a chaff-cutter gives, with immense loss and labour, short cylinders of stalk which no cattle can masticate.

These defects, however, being duly provided against, and a thoroughly efficient machine being available such as that described by the firm in which the straw is quite converted into fodder in the one operation, the question of its general introduction will depend on—

1*st*, prime cost and motive power;
2*nd*, comparative working expense;
3*rd*, maintenance and durability.

On the two last points we have no data, so long as we are told that a little straw or any rubbish will work the engine. But probably if the average cost of preparing our grain for the market is furnished to the makers, they can readily supply a comparative statement of the two systems, basing their calculations on the cost of working by steam with wood-fuel or coal at about £3 per ton (in this locality), wood being proportionately as regards effective working about the same cost; or if by cattle-power, at the same rates as given in appended statement of the average cost of preparing grain as practised all over India, with practically the same results.

My own opinion is, that efficient machinery worked by cattle-power, preferably on the inclined plane, would in every way be the cheapest and best suited to the country, and ensure a better separation of the varieties of seed so commonly sown together (and for many good reasons) all over India.

In canal-irrigated tracts, where sugarcane and indigo sowings are almost contemporary with the rabi harvest, it is of the utmost importance to get bullock labour freed from harvesting operations, to give them reasonable time for thorough preparation of land for these crops, which, under existing circumstances, is, I fear, only partially done for fully 50 per cent. of the crop—hence a falling off in results.

And whereas it will be seen that harvesting usually costs fully 10 per cent. of the value of the crop under the most favourable circumstances, I am quite sure that I am within the mark when I say that more than 15, and in a large proportion even more than 20, per cent. would not cover the cost of harvesting in such seasons as the last two or three we have had, when easterly winds and frequent showers (instead of dry hot winds) make the straw less friable, and keep up an humidity which prevents the separation of the grain from the ear; while the process of winnowing is utterly impracticable, and the loss to both the cultivator and the State in the item of interest on deferred payment of rents alone would be a handsome consideration in any country where prompt dealings were recognised, not to mention the more obvious and incalculable loss of, and injury done to, both grain and fodder; which latter will scarcely bear stacking, and has been so much depreciated that none like to risk keeping it, even though the contingency of another year of drought became more and more imminent day by day.

In proof of the above, I was long ago so impressed with the necessity of some intervention to expedite harvesting, that I did purchase from this firm the best set of handy threshing and winnowing apparatus they exhibited at Agra in 1867, when from dear-bought experience I learnt its utter inapplicability and inability to deal with Indian produce—from no inherent fault in the action of the machinery itself, but simply from the peculiar nature of the produce to be dealt with; and which in the case of wheat makes it practically more valuable in the small proportion of husk to alimentary food compared with any other wheat; while from a similar cause the barley is deficient in some of those good malting qualities which mark the difference between the best Indian (hill) made and good English beer, while the straw of both possesses an amount of good nourishment not found in that of other climates peculiarly adapted to the condition of the mass of the people and the wants of their congeners—the cattle of the country.

Should Government decide upon giving a fair trial to any (well-assured) efficient machinery for agricultural purposes, I shall be glad to offer my services and the assistance of my staff to test and approve its utility; and I venture to say with all deference that no more earnest nor practically interested supervision would be found to satisfy the views of both mahinist and agriculturist.

Memorandum of cost and labour in treading-out, winnowing and cleaning wheat and barley during favourable weather, with an average result of 10 *maunds of grain and* 20 *maunds of bhusa per pair of bullocks and driver in five days.*

The average price of wheat being taken at Rs. 2 per maund, and bhusa (fodder) at four annas per maund, we have—

	Rs.
10 maunds of wheat, at Rs. 2	20
20 „ of bhusa, at annas 4	5
Total ...	25

The average hire of a pair of bullocks with a driver being eight annas per day, the cost of five days' labour may be stated as Rs. 2-8, the result being just 10 per cent. of value of crop; and this, it must be remembered, is only obtained in very favourable weather and at average rates of value and hire, which latter is certainly much below the mark at that time, and might fairly have 50 per cent. added to it if there be an average crop to dispose of.

J. MICHEL.

Dated the 4th June 1878.

From—H. J. SMITH, Esq., Indigo-planter and Zamindar, Barla,

To—The Officiating Collector, Aligarh.

I have the honour to acknowledge your docket No. 267, dated 16th ultimo, enclosing circular and letters (marginally noted and herewith returned) on the subject of the employment of steam-threshing machines.

No. 63, dated 21st February 1877, from Secretary to Government of India, to the Secretary to Government of North-Western Provinces, with annexures.

Circular No. 9, dated 22nd April 1878, from the Director of Agriculture and Commerce, North-Western Provinces, to the Commissioner, Meerut Division.

I beg to apologise for not having replied sooner.

In so far as benefit to the people is concerned, the employment of such machines would be doubtless a great boon, if by their means the threshing could be done cheaper than it is at present.

They would be enabled to get in their corn, &c., much quicker than is now possible for them to do; and their cattle could also be employed in raising crops, which now have to wait until threshing is finished.

If steam-threshing is proposed simply with the view of developing the Indian wheat trade, Government taking the matter up and letting out the machines, it is then necessary to know what charge would be made for the use of it. It should be borne in mind that the labour used in bringing crops to the threshing-floor, and in threshing, is far more generally paid for in grain than in coin.

I have had the subject before me for years, and, as far as I can gather, the zamindars and cultivators have not the slightest prejudice against them; but the principal question is one of cost.

Another most important question is also that of transit of the machine.

From what I know of the condition of the Government katcha and village roads in this district, it would be almost an impossibility in nine cases out of ten to get such ponderous machines along them.

An abstract of the opinions of the Commissioners on the introduction of steam-threshing machines in India.

Kumaun.—Writes that steam-threshing machines would be useless in this country, where the system is almost ryotwari.

Fyzabad.—States that the time has not yet come for the employment of such a machine in the agricultural operations of this country

with any reasonable prospect of success, and that the fact that grain is the property of a number of petty cultivators is a great obstacle, as also is the practice of sending grain on threshing-floors.

Rai Bareli.—All consulted on the subject unanimously condemn the proposal of introducing the machine into this country. The European managers of two talukas—Major Orr and Mr. Gartlan—make the same objection of the divided ownership, and give other reasons against the machines (see their letters).

Benares.—All the district officers (with the exception of Basti, who has not sent in any reply) of this division are quite averse to the employment of the machine in this country, on the ground (1) that natives do not prefer threshing by machinery to threshing by bullocks; (2) that the machine is costly; and (3) that, if such a machine were introduced, the bullocks will be without employment, and there would be less fodder if their threshing-work is done by machinery. The Collector of Gorakhpur wants a cheap and effective winnowing machine for cleaning corn.

Lucknow.—Is of the same opinion as Fyzabad; adds that experience has shown it is a mistake to attempt the use of such a machinery in places where it cannot be readily repaired.

Rohilkhand.—The majority of the district officers of this division, with Luchmee Narain and Mr. Wyer, are in favour of the introduction, inasmuch as the machine will execute the threshing-work at a quicker rate than the present system does; and are opposed to it generally on the grounds that the machine cannot be easily transported from one place to another, and that under the circumstances noted above it could hardly ever repay Government. The Commissioner of Rohilkhand expresses a similar opinion; is inclined to have some machinery for threshing purposes, but at a cheaper cost. Suggests the importation of "fanners," which are up to this day employed by the petty farmers in the north of Scotland.

Jhansi.—The district officers who were consulted on the subject are unanimous that, apart from the prohibitive cost of the experiment and other difficulties connected with working it, it would be productive of no practical or useful results, the people and the state of agriculture in the division being too far backward.

Meerut.—The Commissioner is not in favour of the introduction of the machine; for, besides the difficulties at the outset, the carriage of grain in the ear from long distances to the machine would entail much inconvenience and unnecessary expense on the grain-grower. The native method of threshing is admirably adapted to the circumstances of the farmer. Two planters, Messrs. Michel and Smith, advise experiment.

No. 2633A., dated Naini Tal, the 2nd September 1878.

From—C. Robertson, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of my letter No. 2590A., dated the 29th August, I am directed to submit, for the information of His Excellency the

Governor General in Council, copy of a letter No. $\frac{598T}{CLXIA}$, dated the 26th idem, from the Director of Agriculture and Commerce, North-Western Provinces and Oudh, and enclosures in original (return requested), on the question of introducing steam-threshing machines into India.

No. $\frac{598T}{CLXIA}$, dated Naini Tal, the 26th August 1878.

From—E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Secretary to the Government, N. W. P. and Oudh.

In continuation of my No. $\frac{553T}{CLXIA}$, dated 17th instant, I have the honour to forward a letter from the Commissioner of the Agra Division, on the subject of the steam-threshing machine.

2. The Commissioner states that he agrees with Mr. Browne, a planter in the Agra district, that if such machines are introduced at all, they must, in the first instance, be introduced by capitalists interested in the export trade. This opinion confirms the desirability of the course I have proposed, to allow a trial to be made in the first instance by two of our leading North-West planters.

3. The general opinion of Agra district officers is, that the native agricultural conditions are unsuited to the proposed system; but some of the planters consulted incline more favourably than the officials to the idea of introducing it.

4. I call attention to paragraph 4 of Collector of Agra's letter. Mr. Browne supports what I have said in my first letter as to the inutility of cleaning wheat for export when it is subject to adulteration from the hands through which it passes between the threshing-floor and London. I fear that Calcutta is by no means guiltless; and that even if wheat left Cawnpore in a clean condition, it would not be found in the same state on boardship.

Note.—The following letters might be printed *in extenso*:—

Collector of Agra.
Commissioner of Agra.
Collector of Etawah, and enclosure from Mr. Kinlock.

No. 49, dated Agra, the 9th August 1878.

From—C. CURRIE, Esq., Commissioner, Agra Division,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

In compliance with the request contained in your circular No. 9A., dated 22nd April 1878, I consulted the officers marginally noted on the subject of steam-threshing machines; and I have now the honour to submit their replies, together with the opinions of certain planters.

Collector of Agra.
" Farakhabad.
" Etawah.

2. I concur with those officers who have expressed the opinion that the time has not yet arrived when steam-threshing machines can be

advantageously introduced generally into this country. I think Mr. Browne is "correct in saying,* that if such machines are to be introduced at all, they must, in the first instance at least, be introduced by capitalists interested in the export trade. Doubtless, if steam-threshing machines could be employed to go from village to village to thresh the grain, advantage might be derived from their introduction; but any one acquainted with the village roads of the country must know that it is quite impossible to take such machines from village to village. As the machine cannot be taken to the grain, the grain must be brought to the machine; and this can only be done by the employment of capital.

* See paragraph 4 of Collector of Agra's letter.

No. 374, dated the 14th June 1878.

From—W. LAWRENCE, Esq., Collector of Agra,

To—The Commissioner, Agra Division.

With reference to enclosures forwarded with your circular No. 27, dated 14th ultimo, I have the honour to state that Mr. McMinn, C.S., and Mr. H. A. Browne, late of the Omurgarh Factory, Pargana Jalesar, have favoured me with opinions.

2. The former gentleman considers that the English mode of farming and threshing is at least 100 per cent. cheaper than the Indian method; and from his Irish experience draws the conclusion that steam machinery, once introduced, must oust the old-fangled methods; and adds that as native engine-drivers are employed on high-pressure railway engines, they would naturally be capable of working low-pressure stationary engines of 12 or 18 horse-power.

3. Mr. Browne acknowledges, as all practical men must do, the immense importance of developing the industry of an agricultural country like India; but urges the conservation and poverty of the people concerned as almost insuperable objections. He thinks that "no association, firm or private speculator could afford" the expense, time and trouble involved; that a native association for such a purpose is an impossibility, "owing to the want of means and unanimity amongst the different classes, the general apathy of the zamindars, and the nature of the cultivators' tenures"; but that if the Government purposed to introduce such, they should be content with machines driven by cattle-power, as the cultivators could not afford to let their cattle lie idle and pay for steam-power.

4. Mr. Browne is also of opinion that it is not the cultivator who would first benefit by the extra cleanliness of the wheat he had for sale; and even if the borah or small trader received clean wheat, he would, by mixing small kunkur and dust, add to the weight. As it is the exporter or shipper who would alone benefit, and as he alone can reach the small traders, it would seem to be his interest to introduce these improvements.

5. We know that it is only personal interest that has as yet affected any change in any Indian growths. It has been so with cotton and indigo; and the same rule must, I should say, apply to wheat. It

is a favourite idea now-a-days that large Court of Wards can own and work model farms. There are doubtless estates who can pay for such toys; but if the labour as well as the expense are to fall on the estate, its manager must be chosen with reference to his farming experience, and that of a novel character, rather than to other qualities. What native, with office experience or knowledge of our revenue system, can be expected to take up the improvement of agriculture? A non-official native would have even less aptitude, and few, I think, are the available Europeans who would combine these two necessaries; and no Collector or Board of Revenue could afford to employ a man inexperienced in Indian ways because he was a zealous farmer of the new school.

6. Improvements are no doubt wanted: the difficulty is how and by whom they are to be worked. If self-interest does not see its way to making them pay, the outlook is poor.

No. 489, dated Farakhabad, the 25th June 1878.

From—W. IRVINE, Esq., Offg. Collector of Farakhabad,
To—The Commissioner, Agra Division.

With reference to your circular No. 27 of the 14th May 1878, on the subject of steam-threshing machines, I have the honour to submit the opinion called for.

2. I have consulted the only planter in this district—Mr. D. L. Gilmore—who does not think that thezamindars and ryots are likely to use the machine. Mr. Gwyther, Executive Engineer, has expressed the same opinion.

3. It seems to me that the objection raised by Mr. Buck in the third paragraph of his letter of the 24th March 1878 is fatal. The cattle must be kept for other purposes, and at threshing time cannot be utilised otherwise. Any machine therefore, however cheap, or however economical of labour, is, on the whole, an addition to the ryot's expenses.

4. To large exporters for the European markets it might be a matter of importance to have the grain better cleaned in a shorter time. But in this district the grain trade to Calcutta, for ultimate exportation to Europe, has not yet assumed such proportions as to warrant investment in machinery. At present it is in the hands of many small men who deal with Cawnpore. At Cawnpore it is possible that the introduction of one or two steam-threshing machines might be arranged for.

No. 362, dated Etawah, the 26th July 1878.

From—J. SMITH, Esq., Officiating Collector of Etawah,
To—The Commissioner, Agra Division.

In reply to your circular No. 27, dated 14th May last, I have the honour to enclose copies of letters I have received from Mr. Kinlock and Mr. Martin, the leading planters of the district and the most intelligent zamindars we have. I have also questioned other native landholders, who are fairly well educated and are practical agriculturists.

2. My own opinion is, that the time has not yet come to expect that native landholders generally would or could use steam-threshing machinery. The price would put it out of the question in the case of most. A skilled mechanic would be required to keep the machinery in order; and as the crops all require threshing at the same time, I think very few zamindars would club together for the joint use of the machine. Constant disputes would arise for priority of use, while, as things are now, every man has his own bullocks ready for use at any time.

3. There can be no doubt that cleaner grain would result from steam machinery than from the present system; and some other advantages are obvious. But considering the want of good roads connecting villages, the outset price, the probability of the machinery getting out of repair, the enforced idleness of the cattle, and the well-known apathy and want of enterprise in the people themselves, I think it impossible to hope for success at present from the introduction of steam-threshing machinery.

Dated Bholi Factory, the 30th May 1878.

From—C. W. KINLOCK, Esq.,

To—The Officiating Collector of Etawah.

I beg to acknowledge the receipt of your office docket No. 410, dated 29th instant, with a printed correspondence regarding the employment of steam machinery for threshing wheat in India; and, in compliance with your request for my opinion in the matter, I have the honour to make the following remarks on the subject, and to state that I do not think the project would answer out here all at once.

The cultivators are, as a rule, a very poor lot of people, and are, generally speaking, deeply in debt to their zamindar or the village borah, who has a running account with them, and supplies them with food and cattle, pays their rents—in fact, keeps them from hand-to-mouth; and in return takes the labour off their hands, and the produce of their fields. They would not willingly pay anything for the use of the machinery or any charge, however small, for threshing their wheat for two reasons. First, because by doing so they would have to find fodder for their cattle and food for themselves and their families for the time that they are engaged in threshing their grain, when both are supplied as an established custom or perquisite out of their own crop. Then again the difficulties that would exist in getting the wheat to the threshing machine would not be few, or easily overcome; there being no roads for the machine to travel upon, or cattle strong enough to drag it over the fields to the different khullians or threshing-floors where the village grain is stored; and I feel pretty certain the cultivators would object to carry the grain to the machine for nothing.

There is no doubt that a steam-threshing machine would be a great advantage to the country and the export grain trade, if the growers could only be brought to see the benefits to be derived hereafter from its use; but without a trial, and the natives actually seeing for themselves the advantages to be gained in a pecuniary point to them from the use

of the machine, nothing, if any, could induce them to depart from the old system of threshing grain.

If, however, the Government are disposed to try the experiment, I shall be very glad to render all the help in my power, and supply my own and my assamees' wheat in this (Bhartna) pargana to be threshed by the machine. And if the machine is put up at this factory, I would further engage to supply the fuel required free of charge; and if the engine could be utilised to work during my manufacturing in July, August and September, when it would be lying idle, to heat my indigo vats, I should hire it, instead of employing manual labour as I do now.

Dated Mainpuri, the 23rd July 1878.

From—W. MARTIN, Esq.,

To—The Officiating Collector of Etawah.

Your circular docket No. 443 of 6th June 1878, with printed correspondence and despatch from Secretary of State, proposing to import steam-threshing and winnowing machines with a view to develop the Indian trade in wheat, has just reached me after travelling backward and forward between Oudh and Rohilkhand; and I hasten to send you my opinion on the subject, as desired.

I think there can be no doubt that, in addition to the advantages contemplated by Mr. Head, the introduction of the threshing machinery would be a boon to the Indian agriculturist, as well as to the English consumer. To the former it would afford means of competing with other countries, by producing a better quality of wheat and obtaining higher prices than can be obtained for the stuff obtained under the present tedious process; whilst it would enable the latter to buy his food at considerably cheaper prices, owing to the competition arising from daily increasing exports from India. The primitive method of threshing grain by cattle, which still prevails all over India, exposing the grain, as it does, to the inclemency of the weather, the threshing operations being carried on in the open, involves considerable loss and damage by unseasonable falls of rain in every three out of five years, whilst on the other hand it does not admit of separating the wheat from foreign substances, which grow spontaneously, and form 6 to 10 per cent. of the whole. The wheat is now exported in its impure state; and the cost of winnowing in England, which is expensive, and the freight of foreign substances, go a great way in depreciating the value of the Indian wheat.

I do not think there will be any difficulty either in getting the ryots to use the machines, inasmuch as it ensures economy of time and expense on the one hand, whilst the rapid process secures the grain from loss and damage from wet weather on the other. In canal-irrigated tracts, where kharif cultivation follows immediately on the cutting of the rabi crops, and the threshing operations have to be postponed for a whole month, the ryots will have to thresh by machinery from necessity. In other parts of the country the difficulties contemplated by Mr. Buck in the third paragraph of his letter might have to be encountered at the onset; but so soon as the advantages secured by the improved system

begin to be experienced, the prejudice will wear off, as in the case of canal irrigation, in regard to which similar apprehensions were at first entertained. But as the percentage of loss in straw used for fuel is only estimated at 12 per cent. against 15 per cent., the loss incurred by the process now in vogue, whilst the bruising and macerating capabilities of the machine—conditions necessary for its consumption by cattle—are guaranteed, I do not see how the system is likely to lessen the supply of cattle fodder. As the village roads are not usually metalled in this country, and the draught cattle small, I would suggest the advisability of introducing lighter machinery at first, if possible.

The papers received from you are herewith returned.

No. 2720, dated Naini Tal, the 9th September 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of my letter No. 2633A., dated the 2nd September 1878, I am directed to submit, for the information of His Excellency the Governor General in Council, the papers marginally noted on the question of introducing steam-threshing machines into India.

From Commissioner, Benares, No. 266, dated 26th August 1878.
From Commissioner, Sitapur, No. 2627, dated 26th August 1878, and enclosures.
(To be returned.)

No. $\frac{536}{\text{VII}}$, dated Basti, the 24th August 1878.

From—C. POWLETT, Esq., Collector of Basti,

To—The Commissioner, Benares Division.

In answer to your circular endorsement No. $\frac{22}{\text{VII}}$, dated 14th May 1878, on the letter of the Government of India No. 63, dated 21st February 1877, containing a proposal to introduce steam-threshing machines into this country, I have the honour to inform you that I sent the Government letter to Mr. Peppe, a large grantee in this district, and to Mr. Churcher, manager of another large grant and other landed property, requesting them to favour me with their opinions on the subject.

2. In answer to my request, Mr. Peppe gives it as his opinion that in a district like Basti, where the rabi crop is not so important as the kharif, a steam-threshing machine would be useless. It can thresh 400 to 600 baskets per diem. This, he says, is the average yearly outturn of a whole village; and thus the machine would have to be moved from village to village every day, and the cost of this would be enormous.

3. Mr. Peppe further says that the threshing gives the people no trouble, but serves to employ them and their cattle at a time when nothing

else is doing; and the expense is very trifling. And he is of opinion that fodder from grain trodden out by bullocks is better bruised and fitter for cattle fodder than that threshed out by any machine.

4. Mr. Peppe considers that a small inexpensive machine, capable of being worked by hand-labour or cattle, no part weighing more than one ton, and which could readily separate the wheat from weeds and tares, would be a great boon.

5. Mr. Churcher is also of opinion that the machine described in these papers would not answer, being too heavy and expensive.

No. 266, dated Benares, the 26th August 1878.

Endorsed by Officiating Commissioner, Benares Division.

Copy of the above forwarded to the Director of Agriculture and Commerce, North-Western Provinces and Oudh, in continuation of this office No. 210 of 11th ultimo.

No. 2627, dated Sitapur, the 26th August 1878.

From—COLONEL I. F. MACANDREW, Commissioner, Sitapur Division,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

In reply to your circular No. 9 of 22nd April 1878, and subsequent reminder No. $\frac{1320A}{CXVI}$ of 10th instant, requesting my opinion and that of those whom I might consult on the subject of obtaining a steam-threshing machine for the purpose of exhibiting its powers to the agricultural population, I have the honour to forward copies of the replies of Deputy Commissioners as per margin.

Deputy Commissioner, Sitapur's No. 1175, dated 13th May 1878.
Deputy Commissioner, Hardoi's No. 1085, dated 18th May 1878.
Deputy Commissioner, Kheri's No. 1545, dated 23rd August 1878.

2. I am of opinion that it would be an useless waste of money to get out any such machine. The wages of labour and the price of cattle must rise in this country very greatly before any such machine could be introduced with a chance of success. The machine, moreover, is only recommended for wheat; and when the wheat is threshed out, the bullocks have nothing else to do. There is no other employment for them at that season.

No. 1175, dated Sitapur, the 13th May 1878.

Memo. from—The Deputy Commissioner, Sitapur,

To—The Commissioner, Sitapur Division.

In reply to his circular No. 111-1468, dated 11th instant, begs to state that no such machine is required.

No. 1085, dated Hardoi, the 18th May 1878.

From—The Deputy Commissioner, Hardoi,
To—The Commissioner, Sitapur Division.

With reference to your circular No. 111 of the 11th instant, and enclosures, regarding the introduction of steam-threshing machines into this part of the country, I have the honour to state that the only persons likely to employ such labour would be European planters with plenty of capital; and no such persons exist in this district.

2. The lowest price for the smallest of these machines is given as £163 10*s*. at Ipswich; and the cost of landing one in Hardoi would be considerable. Taking into consideration the loss by exchange in money, probably Rs. 2,500 would represent the price to a zamindar here. It is hopeless to expect any person to incur this outlay in a strange machine, which he might think might only subject him to increased taxation. We lately tried to introduce sugar-mills at *Rs.* 60 *each*. No person would buy one.

3. As to Government introducing these machines at its own expense, I do not think such a course advisable in the present state of the finances. If Government is to spend any money on the improvement of land here, I think it would be better laid out in strengthening the official machinery which regulates the administration of the land revenue.

4. Steam machines would, if taken to by the farmers, throw out of employment thousands of field labourers, whom Government would probably have to support in some way or other. Bullocks, too, would, as Mr. Buck notices, remain in much enforced idleness—a result to be deprecated.

No. 1545, dated Kheri, the 23rd August 1878.

Memo. from—The Deputy Commissioner, Kheri,
To—The Commissioner, Sitapur Division.

In reply to his circular No. 111-1468, dated 11th May last, and enclosure, has the honour to submit the following opinions of landholders in this district on the advisability of introducing steam-threshing machines.

Mr. Carnegy, a grantee, thinks that a machine that would thresh and winnow would pay 5 per cent. on the original cost; but to make it remunerative it should combine irrigating apparatus, and, where expedient, also a saw-mill and steam-plough. But the machine would deprive the poorer classes, who depend for several months in the year on threshing and winnowing, &c., of a livelihood.

Mr. Carnegy is of opinion that the employment of a threshing machine would be of advantage to plough-cattle, by giving them rest and enabling their being used more in the cultivation of sugarcane and cotton.

2. Mr. Hearsey, another grantee, thinks it would not be remunerative, because the cultivator, already left with such a small margin of profit, could not meet the extra charge. It would, however, leave more time for the cultivation of sugarcane, and save much grain from being lost by the delay that now occurs in threshing it out.

The cultivator, Mr. Hearsey thinks, could well afford to pay 5 per cent. of his produce for having it threshed out; but that it is doubtful if this would be remunerative, or cover the outlay.

The time saved could be well employed; and the loss of cattle fodder would be amply counterbalanced by the saving in grain.

3. Raja Indr Bikram Sah of Khairigarh says that each cultivator would require his grain to be threshed separately, and very few cultivators have sufficient produce for a machine; and that it would not therefore answer.

4. Undersigned agrees with the Raja, that the machine would be welcome to large farmers, whose extensive outturn would render the employment of a machine remunerative. But the people here, who cultivate small patches, would not throw their produce into one stock to be threshed out together. We are too backward, in fact, for machinery in agriculture.

It had better be tried in some of the more advanced districts of the North-West and in Bengal.

5. Undersigned cannot say too emphatically that, in order to persuade the people to adopt improvements of this nature, the district officer must be given more time for this purpose than he has at present.

No. 2770A., dated Naini Tal, the 14th September 1878.

From—C. ROBERTSON, Esq., Secretary to the Government, North-Western Provinces and Oudh,

To—The Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

In continuation of my letter No. 2720A., dated the 9th September, I am directed to submit, for the perusal of His Excellency the Governor-General in Council, a letter from the Commissioner of Allahabad, No. 309, dated the 29th August 1878 (return requested), on the question of introducing steam-threshing machines into India.

No. 309, dated Allahabad, the 29th August 1878.

From—J. SIMSON, Esq., Officiating Commissioner, 4th (or Allahabad) Division,

To—The Director of Agriculture and Commerce, North-Western Provinces and Oudh.

I have the honour to reply to your circular No. 9, dated 22nd April last, forwarding, for opinion, copies of correspondence on the advisability of importing steam-threshing machines for employment in the country.

2. The Collector of Allahabad concurs in the following opinion expressed by Mr. Buck: "I question very much whether any project which involves the enforced idleness of cattle by the substitution of other labour, however cheap, is likely to be remunerative; nor does it appear desirable to encourage a system which lessens the supply of cattle fodder."

3. The question was referred by the Collector to Captain Chapman for an expression of his opinion; but the latter states that his views

have already been made known to Government, and that he has requested Government to supply him with a steam-threshing machine.

4. The Collector of Cawnpore is of opinion that the day seems very distant when such a machine is likely to be useful in this country; its cost being prohibitive, and the difficulty of moving it with small Indian bullocks, even on first class metalled roads, would be very great; and it would be absolutely impossible to move it on the second and third class roads.

5. The Collector of Jaunpur concurs generally with the opinion expressed by Mr. Nickels, Indigo-planter, namely, that steam-threshing machines will never answer in India; for nothing will induce the people to change their present mode of threshing. A few of the wealthy zamindars might be induced to purchase these machines; but Mr. Nickels doubts whether they would work them long. He considers that the Government might import a few of these machines, and show them to the people; and then the wealthy zamindars and others might be induced to invest in such machinery, if it could be demonstrated to them that it did its work cheaply.

6. I concur generally in the views expressed by the district officers consulted; and I think it would be unwise for Government to incur any large expenditure in the importation of these costly machines, in the expectation of thereby inducing natives to make use of them.

7. A few wealthy landholders, such as the Maharajas of Benares and Vizianagram, might possibly be induced to purchase a machine. But, after the novelty had worn off, the machine would shortly be laid aside as an expensive toy, and the services of the skilled mechanic be dispensed with.

8. I do not see how travelling machines could be utilised in the way proposed; for, unless they could actually visit individual villages, lying at some distance from the main roads (which would be quite impracticable), it would be vain to expect the villagers to make use of them. To reach the machine, it would be necessary for these villagers to transport their produce to considerable distances; and this they would not willingly consent to do.

9. Even were it made clear that the employment of such machines was more economical than the present system, I do not believe native agriculturalists would make use of them, but would prefer to utilise their bullocks and manual labour in "the good old way" followed by their forefathers.

No. 22, dated Simla, the 3rd October 1878.

From—The Government of India,

To—The Secretary of State for India.

Referring to paragraph 7 of our despatch No. 14, dated the 22nd July last, we have the honour to forward copy of the letters marginally noted from the Government of the North-Western

From the Government of the North-Western Provinces and Oudh, No. 2590A., dated the 29th August 1878, and enclosures.

From the Government of the North-Western Provinces and Oudh, No. 2633A., dated the 2nd September 1878, and enclosures.

From the Government of the North-Western Provinces and Oudh, No. 2720, dated the 9th September 1878, and enclosures.

From the Government of the North-Western Provinces and Oudh, No. 2770A., dated the 14th September 1878, and enclosure.

Provinces and Oudh, on the subject of the proposed employment in India of steam-threshing machines; and to express concurrence with the decision arrived at by that Government, which is adverse to the proposal.

No. 51-53, dated Calcutta, the 14th March 1877.

From—G. H. M. BATTEN, Esq., Offg. Secy. to the Govt. of India, Dept. of Revenue, Agriculture, and Commerce,

To—The Secretaries to the Chambers of Commerce, Madras, Bombay and Bengal.

In forwarding, for the information of the Chambers of Commerce, Madras, Bombay and Bengal, a copy of the papers noted in the margin, on the subject of the suggested improvements in the quality of Indian wheat, I am directed to draw attention to that part of the letter from a London merchant, enclosed in the Secretary of State's despatch No. 130, dated the 21st December 1876, in which he refers to the expediency of using blowing, winnowing and screening machines, and to the observation thereon contained in paragraph 3 of the Resolution of the 14th instant. I am to suggest that merchants would perhaps find it to their advantage to employ some such means for cleaning their consignments of grain before shipping them.

Resolution No. 1—39-50, dated 14th instant, and the papers read therein.

Dated Bombay, the 3rd April 1877.

From—J. GORDON, Esq., Secretary to the Bombay Chamber of Commerce,

To—The Offg. Secretary to the Government of India, Department of Revenue, Agriculture, and Commerce.

I am directed by the Committee of the Chamber of Commerce to acknowledge, with the thanks of the Chamber, the receipt of your letter No. 52, and of the papers which accompanied it, on the subject of the suggested improvements in the quality of Indian wheat.

The compilation which the Secretary of State has desired to be prepared, bringing together all the facts procurable regarding wheat cultivation in India, referred to in paragraph 5 of the Resolution of the Government of India, will be very interesting and useful; and the Committee desire me respectfully to ask the favour of your supplying the Chamber with copies of it as soon as it is ready.

With reference to your suggestion that merchants would perhaps find it to their advantage to clean their consignments of grain before shipping them, I am directed to state that this has generally always been done by merchants at this port. Exporters use for this purpose the best machines obtainable from England; and large quantities of dhall, gram, barley and other substances are thereby removed. But with the ordinary qualities of Bombay wheat it is absolutely impossible, even with the best machines at present known, to separate all inferior grains. The admixture results, as Government has pointed out, from the habit of the cultivators of sowing inferior grains with their wheat in the

same field; and the Chamber observes, with much satisfaction, the efforts of Government to persuade the cultivators, both in sowing and in reaping, to keep these grains apart from the wheat.

In conclusion, the Committee direct me to say that a reduction in the present high cost of carriage of grain from the wheat-producing districts to this port would probably result in a further considerable development of the export trade. The Government of Bombay concurs with the Chamber in this view; but defers urging at present any reduction upon the Great Indian Peninsula Railway Company on account of the resources of the Company being already overtaxed by the demands of the famine districts. But the Chamber earnestly hopes that the Government of India will take the first opportunity of pressing on the Railway Company a reduction of rates for the carriage of grains; for such a reduction, while increasing the traffic, will confer the greatest benefit on all concerned.

Dated Calcutta, the 9th May 1877.

From—H. W. I. Wood, Esq., Secretary to the Bengal Chamber of Commerce,

To—The Offg. Secretary to the Government of India, Department of Revenue, Agriculture and Commerce.

The Committee of the Chamber of Commerce desire me to acknowledge the receipt of your letter No. 53 of 14th March, on the subject of improving the condition of wheat shipped from this country to England, and to communicate the following remarks in reply.

The experience of exporters from Calcutta proves that all qualities of wheat, from the lowest to the highest, meet with a ready sale at home, notwithstanding the somewhat imperfect state in which they are placed upon the markets there.

The cleaning of the grain is a very simple matter; and if it will pay the merchants to adopt that process, the Government need not apprehend that it will be neglected. Home dealers, however, do not buy wheat with guarantees of percentage of admixture, as is the case with linseed and other oilseeds; and it is evident that the grain suits them well enough in its present state. Of course, if the dealers could get it cleaner for the same money, they would not object to any improvement in that respect.

The purchasers and exporters from Calcutta do not find that wheat is much adulterated with other grain. Occasionally a trifling exception may be noticed; but usually the refraction is earthy matter, which gets accidentally introduced when the wheat is being winnowed.

The great fault of Cawnpore and similar wheat is the admixture of red grain with the white; and to this no doubt exception is taken at home.

If this can be avoided by the selection of seed, it would be desirable in the interests of native cultivators of wheat crops to have this material point pressed upon them, as they would thereby be saved the depreciated price they now realise—say 4 to 6 annas per maund, or 25 per cent. of

the price they usually get in the growing districts. On this point, however, it cannot be stated with certainty that the presence of red grain is attributable to the seed, as the native agriculturists assert that it is caused by rain and cold, followed by wind. And this would appear to be borne out by the crop of this season, which abounds with red wheat—much more so than last year; and the season was a very wet one.

A great deal of wheat is now being grown on land not suited for it; but this will probably right itself, as the ryot will take time to learn what crop will pay him best—wheat being a new one to him on its present scale. This results in parcels of inferior stuff, which find ready market however; and if they pay the cultivator better than another crop, of course he is quite right to grow it.

The Committee of the Chamber are inclined, on the whole, to deprecate any active interference by Government; and, while they duly appreciate the excellent motive which prompts the various recommendations and suggestions contained in their official Resolution, they are not unmindful of the results of the Cotton Frauds Act in Bombay.

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